

Teacher's Edition

Scott, Foresman

# Invitation to Mathematics: 4



$$20 \div 5 = 4$$



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# Invitation to Mathematics: 4

Teacher's Edition

## Authors and Advisors

L. Carey Bolster  
Supervisor of Mathematics  
Baltimore County Public Schools  
Towson, Maryland

Warren Crown  
Associate Professor of Mathematics  
Education  
Rutgers University  
New Brunswick, New Jersey

Robert Hamada  
Instructional Specialist, Mathematics  
Los Angeles Unified School District  
Los Angeles, California

Viggo Hansen  
Professor, Mathematics Education  
California State University  
Northridge, California

Mary Montgomery Lindquist  
Professor of Mathematics Education  
Columbus College  
Columbus, Georgia

Charles McNerney  
Professor of Mathematics  
University of Northern Colorado  
Greeley, Colorado

William Nibbelink  
Professor and Chairman  
Division of Early Childhood and  
Elementary Education  
University of Iowa  
Iowa City, Iowa

Glenn Prigge  
Professor of Mathematics  
University of North Dakota  
Grand Forks, North Dakota

Cathy Rahlfs  
Math Coordinator K-12  
Humble Independent School District  
Humble, Texas

David Robitaille  
Head, Department of Mathematics  
and Science Education  
University of British Columbia  
Vancouver, British Columbia, Canada

James Schultz  
Associate Professor of Mathematics  
The Ohio State University  
Columbus, Ohio

Sidney Sharron  
Formerly, Supervisor Instructional Materials  
Los Angeles Unified School District  
Los Angeles, California

Jane Swafford  
Professor of Mathematics  
Northern Michigan University  
Marquette, Michigan

Irvin Vance  
Professor of Mathematical Sciences  
New Mexico State University  
Las Cruces, New Mexico

David E. Williams  
Director of Mathematics Education  
Division of Mathematics  
School District of Philadelphia  
Philadelphia, Pennsylvania

James Wilson  
Professor of Mathematics Education  
University of Georgia  
Athens, Georgia

Robert Wisner  
Professor of Mathematical Sciences  
New Mexico State University  
Las Cruces, New Mexico

## Scott, Foresman and Company

Editorial Offices: Glenview, Illinois

Regional Offices: Sunnyvale, California •  
Tucker, Georgia • Glenview, Illinois •  
Oakland, New Jersey • Dallas, Texas



#### **Teacher Consultants for Grade 4**

Guadalupe Flores  
Stonewall Elementary School  
804 Stonewall Street  
San Antonio, Texas

Annie Mayes  
Indianapolis Public Schools  
120 East Walnut Street  
Education Center, Room 402  
Indianapolis, Indiana

Yvonne Krumnow  
Department of Defense  
Dependents Schools  
Erlangen American School  
West Germany

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# Invitation to Mathematics, K-8

## *Teaching Math for Understanding*

### **Manipulatives**

Punchouts and Manipulative Kits, consistently integrated throughout the program, provide a wealth of hands-on experiences that aid understanding and increase enjoyment of math learning.

### **Problem Solving**

Emphasis on applying math knowledge, skills, and experiences to problem-solving situations develops strong higher-order thinking skills.

### **Number Sense**

Special focus on numeration, estimation, and mental math helps students develop a true understanding of numbers.

### **Professional Support**

Success-oriented text features plus a wide variety of supplements provide everything to make math more exciting, meaningful, and easy to teach.



# Manipulatives

## Objective 119

Find equal fractions by using pictures and number lines.

### Vocabulary

Equal fractions

### Materials

- Measuring cups (Math Kit)
- Pint, quart containers
- Water
- Fraction Bars (Teaching Aid 1 or Math Kit)

### Introduction

**Motivational Situation** Pose this problem to students. How could you and a friend share a quart of milk equally but one of you gets two equal glassfuls and the other gets four equal glassfuls? [Each would get a pint of milk, but one pours the milk into two equal glasses that measure one cup each, and the other pours the milk into four equal glasses that measure one half cup each.] You may wish to demonstrate this situation with measuring cups and water.

### Using the Pages

**Teach** **Using Concrete Materials** For Example A, encourage students to use 2 fraction bars of wholes to represent the 2 loaves. Students should identify how many people had bread. [4] Then they should use their models to determine what part of one loaf each person had. [1/2 loaf] Students should conclude that Mr. and Mrs. Renner each had 1/2 loaf, Amanda had 1/2 loaf that was cut into 2 pieces, and David had 1/2 loaf that was cut into 4 pieces. In Example B, reinforce students' understanding of fractions by having them count the sections that make up one whole on each fraction bar. There are two sections on the halves bar, three sections on the thirds bar, four sections on the fourths bar, and so on. When working through the example, have students place the fraction bars for 1/2 on their desks. Then have them place the fraction bar for fourths over 1/2 to see how many fourths make up the same amount as 1/2. Have students write the sentence that shows the equal fractions. Repeat the activity for sixths, eighths, and tenths.

To extend Example C, have students find fractions equal to 3/4, 2/6, and 4/10. [3/4 = 6/8, 9/12; 2/6 = 1/3, 4/12; 4/10 = 2/5]

**Try** **Using Concrete Materials** For Exercise e, students use their fraction bars marked in sixths to mark off the distance equal to 2/12 on a new fraction (Continued on page 319.)

318 Chapter 11

### Equal Fractions

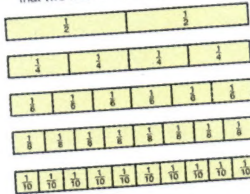
See Using the Pages for a discussion of these examples. Work in groups of 4.

- a. Mrs. Renner had two mini-loaves of French bread. She cut them into pieces for her family. Each person got the same amount of the bread with none left over. Mr. and Mrs. Renner each had 1 piece, Amanda had 2 equal pieces, and David had 4 equal pieces. How can this be?

Discuss this situation in your group. Be prepared to show how this can be and explain your thinking to the class.



- b. You can use fraction bars to show that two fractions are equal.



- c. Use fraction bars to find some fractions equal to 1/2.

**Try** Use fraction bars to find the equal fractions.

- a.  $\frac{1}{2} = \frac{2}{4}$  b.  $\frac{1}{2} = \frac{4}{8}$  c.  $\frac{1}{2} = \frac{3}{6}$  d.  $\frac{1}{2} = \frac{5}{10}$
- e. Make a fraction bar that is marked in twelfths to go with your set of fraction bars. One sixth and two twelfths are equal fractions. How does this help you make the fraction bar? **Using the fraction bar for sixths, divide each of the sixths in half.**
- f. Use equal fractions to explain how each of the Renners got the same amount of French bread. **See margin.**

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### Practice 119

Use the pictures to help you find equal fractions.

1.  $\frac{2}{4} = \frac{1}{2}$

2.  $\frac{3}{6} = \frac{1}{2}$

3.  $\frac{4}{8} = \frac{1}{2}$

4.  $\frac{5}{10} = \frac{1}{2}$

Use the number lines to complete each pair of equal fractions.

5.  $\frac{1}{2} = \frac{2}{4}$  6.  $\frac{1}{2} = \frac{3}{6}$

7.  $\frac{1}{2} = \frac{4}{8}$  8.  $\frac{1}{2} = \frac{5}{10}$

9.  $\frac{1}{2} = \frac{6}{12}$  10.  $\frac{1}{2} = \frac{7}{14}$

11.  $\frac{1}{2} = \frac{8}{16}$  12.  $\frac{1}{2} = \frac{9}{18}$

13.  $\frac{1}{2} = \frac{10}{20}$  14.  $\frac{1}{2} = \frac{11}{22}$

### Reteaching 119

Use the pictures to help you find equal fractions.

1.  $\frac{2}{4} = \frac{1}{2}$

2.  $\frac{3}{6} = \frac{1}{2}$

3.  $\frac{4}{8} = \frac{1}{2}$

4.  $\frac{5}{10} = \frac{1}{2}$

Use the number lines.

5.  $\frac{1}{2} = \frac{2}{4}$  6.  $\frac{1}{2} = \frac{3}{6}$

7.  $\frac{1}{2} = \frac{4}{8}$  8.  $\frac{1}{2} = \frac{5}{10}$

9.  $\frac{1}{2} = \frac{6}{12}$  10.  $\frac{1}{2} = \frac{7}{14}$

11.  $\frac{1}{2} = \frac{8}{16}$  12.  $\frac{1}{2} = \frac{9}{18}$

13.  $\frac{1}{2} = \frac{10}{20}$  14.  $\frac{1}{2} = \frac{11}{22}$

To ensure understanding, concepts are introduced at the concrete level. Student Text pages indicate which concrete materials can be used. A gradual transition from pictorial to symbolic work is provided.



**All the hands-on components  
you need for teaching success!**

### **Punchout Manipulatives, K-8**

Rulers, clocks, simulated money—punchout manipulatives enrich math learning with individual student sets for each grade. Each set is sturdy and punches out easily. Comes in its own handy storage envelope for Grades 3-8; bound into the text for Grades K-2. Activities with punchouts and references to punchouts are right in the lesson notes.



### **Manipulative Kits, K-8**

Fully integrated into the program, each Kit includes: six 4-Paks, a Teacher Demonstration Kit, and a sturdy wire storage rack (each item is also available separately). The 4-Pak consists of a durable, plastic case with a variety of concrete materials, such as a geoboard, base ten blocks, rulers, and spinners. Each 4-Pak is designed for four students to work together in cooperative learning groups. To help teachers model key math concepts, the Teacher Demonstration Kit provides enlarged manipulatives and teaching accessories, including fraction sets and a balance and weights that are stored in a sturdy plastic tub.





# P Problem Solving

## Problem Solving Interpreting Remainders

When you use division to solve a problem, you may need to decide what the remainder means.

Mrs. Ching's class is making hats for a class play. They need 35 colored feathers. The feathers come in packages of 3 each. How many packages do they need to buy?

**Read** Facts: 35 feathers needed, 3 in each package  
Find: Number of packages to buy

**Plan** Think of 35 separated into equal groups with 3 in each group. Use division. Find  $35 \div 3$ .

**Solve**

$$\begin{array}{r} 11 \text{ R}2 \\ 3 \overline{)35} \\ \underline{30} \phantom{0} \\ 05 \phantom{0} \\ \underline{03} \phantom{0} \\ 2 \phantom{0} \end{array}$$

Estimate using compatible numbers:  
 $30 \div 3 = 10$

**Answer** They need 11 packages plus 2 more feathers. To get 2 more feathers, they must buy 1 more package.  $11 + 1 = 12$   
The class needs to buy 12 packages of feathers.

**Look Back** Since 35 feathers are needed and  $11 \times 3 = 33$ , 11 packages would not be enough.  
Since  $12 \times 3 = 36$ , 12 packages would be enough.

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**Try** Solve each problem.

- The class must sell \$95 worth of tickets to cover costs. How many \$2 tickets must they sell?

- If 2 bows are needed for each hat, how many hats can be made with 57 bows?

**Apply** Solve each problem.

- The students can make 6 tickets from each sheet of paper. How many sheets of paper are needed for 125 tickets?

- There are 15 sheets of poster board for making signs. If 2 sheets are needed for each sign, how many signs can be made?

- If 2 yards of fabric are needed for each costume, how many costumes can be made from 25 yards? How much fabric will be left over?

- Diane has 108 inches of ribbon. If she cuts as many 8-inch pieces as possible, how much ribbon will be left over?

- One group has 50 squares of green felt. They need 4 squares for each hat. How many green hats can they make?

- The class needs 144 buttons for the costumes. If there are 5 buttons on a card, how many cards are needed?

- Laura and Ben will set up chairs for the play. They have 75 chairs to put in rows of 8 each. How many chairs will be left over?

- Dawn needs 38 gold stars for her costume. The stars come on sheets of 4 each. How many sheets does she need to buy?

More Practice Set 95, page 386 257

**Five-Step Problem-Solving Method** gives students a helpful guide for solving real-life problems.

**Focus on one of the steps** is provided in each lesson (as shown by the box).

**Problem-Solving Penguin** reminds students of various problem-solving strategies.

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.

### PROBLEM-SOLVING STRATEGIES


- MAKE A TABLE
- FIND A PATTERN
- USE PHYSICAL MODELS
- USE LOGICAL REASONING
- WORK BACKWARD
- LIST ALL POSSIBILITIES
- TRY AND CHECK
- DRAW A DIAGRAM
- MAKE A GRAPH





**A continuous, consistent emphasis on problem solving builds students' thinking skills.**

**Daily "Apply" Problems** include "Thinking Skills," "Use Data From . . .," and "Write a Problem" exercises. "Find the Facts" exercises require students to find data elsewhere in the text or outside the text.

Each  means 2 students

How many members of the bicycle club?

1. first grade?
2. second grade?
3. third grade?
4. fourth grade?
5. fifth grade?
6. sixth grade?

7. Which grade has the most students who belong to the bicycle club?

8. Which grade has the fewest students who belong to the bicycle club?

9. Does first grade or fifth grade have more students who belong to the bicycle club?

10. Which three grades have the same number of students who belong to the bicycle club?

**Apply** Solve each problem.

**Use data from a pictograph.** Use the pictograph above for Problems 11–13.

11. How many fewer members of the bicycle club are from second grade than from fifth grade?
12. How many more members of the bicycle club are from fifth grade than from sixth grade?
13. All of the bicycle-club members who are in the fourth, fifth, and sixth grades went on a field trip. How many members went?
14. **Thinking skills** Lorie is making a pictograph. She will use one circle to mean 2 students. How many circles will she use to show 4 students? 1 student? 15 students?
15. Using each of the digits 0 through 9 once, write two 5-digit numbers that have a sum of 90,000.

Using Problem-Solving Strategies, page 432  
More Practice Set 123, page 395 **333**

## Using Problem-Solving Strategies

### CAT PUZZLE

Janice, Barbara, Lynn, and Margaret each own a cat. The cats' names are Juggles, Bingo, Lovey, and Muff.

Each of the cats has a name that begins with a letter different from the first letter of its owner's name.

Bingo's owner is one of Margaret's best friends. Janice doesn't know Muff's owner, but she took care of Lynn's cat, Juggles, while Lynn was on vacation. Who owns which cat?



1. Who owns Juggles?
2. Can Janice own Muff? Can Margaret?
3. Who owns Muff?
4. Can Margaret own Bingo?
5. Who owns Bingo?
6. Who owns which cat?



Using Problem-Solving Strategies pages in every chapter help students develop various strategies that can be used to solve problems:

- Choose the operation
- Find a pattern
- Write a number sentence/equation
- Make a table
- Try and check
- Draw a picture
- List all possibilities
- Work backward
- Use physical models
- Use logical reasoning
- Use estimation
- Solve a simpler problem
- Use ratios
- Make a graph
- Use a formula



# N umber Sense

## Estimating Products: Mental Math

- A. City workers planted 28 trees in a park. Each tree cost \$52. About how much did the trees cost in all?

Estimate  $28 \times 52$ .

Round both 28 and 52 to the nearest 10. Then multiply.

$$\begin{array}{r} 28 \times 52 \\ \downarrow \quad \downarrow \\ 30 \times 50 = 1,500 \end{array}$$

The trees cost about \$1,500 in all.

- B. Estimate  $34 \times 62$ .

Round both 34 and 62 to the nearest 10. Then multiply.

$$\begin{array}{r} 34 \times 62 \\ \downarrow \quad \downarrow \\ 30 \times 60 = 1,800 \end{array}$$

*Discuss* Is the actual product more or less than the estimate?

## Mental Math Strategies

Kay is a wizard at math. Often, she can do addition and subtraction mentally.

This is how Kay does it.



Compute mentally. Use your mind to save you time.

A.  $63 + 24 =$

$60 + 20 = 80$   
 $3 + 4 = 7$   
 $80 + 7 = 87$

The answer is 87.

C.  $58 + 37 =$

$58 + 30 = 88$   
 $88 + 7 = 95$

The answer is 95.

E.  $78 - 35 =$

$78 - 30 = 48$   
 $48 - 5 = 43$

The answer is 43.

B.  $98 + 56 =$

$98$  is 2 less than 100.  
 $100 + 56 = 156$   
 $156 - 2 = 154$

The answer is 154.

D.  $132 - 97 =$

$97$  is 3 less than 100.  
Add 3 to both numbers.  
 $135 - 100 = 35$

The answer is 35.

Find each sum or difference mentally.

- |                |                |                 |                 |                 |
|----------------|----------------|-----------------|-----------------|-----------------|
| 1. $52 + 37$   | 2. $99 + 43$   | 3. $86 - 45$    | 4. $132 - 99$   | 5. $47 - 19$    |
| 6. $68 - 27$   | 7. $28 + 44$   | 8. $44 + 37$    | 9. $124 - 98$   | 10. $97 + 58$   |
| 11. $17 + 46$  | 12. $76 - 18$  | 13. $28 + 47$   | 14. $73 - 56$   | 15. $157 - 97$  |
| 16. $145 + 96$ | 17. $253 + 38$ | 18. $224 + 398$ | 19. $402 + 167$ | 20. $532 - 299$ |

**Mental Math Strategies** are taught and practiced to develop students' ability to compute mentally. A Mental Math Cat reminds students that mental math is often more efficient.

**Estimation Lessons** teach estimation strategies that reinforce number sense and develop mental math skills. An Estimation Owl appears at times to remind students to estimate answers.



**A variety of exercises help students develop a true understanding of numbers.**

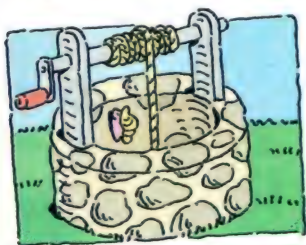
### Calculator

#### JOHNSON'S MEAT MARKET PRICES

Baked Ham	\$2.78 per lb.
Whole Chicken	\$0.54 per lb.
Beef Liver	\$0.59 per lb.
Boston Beef Roast	\$1.89 per lb.
Smoked Sausage	\$1.99 per lb.
Turkey Breast	\$2.79 per lb.

Choose a method to solve the following problems.

6. A snail is trying to climb out of a 12-meter well. He crawls up 3 meters each day and slides back 2 meters each night. How long will it take him to climb out of the well?



Use your calculator to complete these orders.

- 3 lb. of chicken
- 2 lb. of sausage
- 1 lb. of liver
- 2 lb. of roast
- 1 lb. of ham
- total

- 2 lb. of ham
- 3 lb. of roast
- 1 lb. of sausage
- 3 lb. of turkey
- 2 lb. of chicken
- total

7. If the same snail falls into a 15-meter well, how long will it take him to climb out of the well?
8. The poor snail fell into another well. This time it took him 16 days to climb out. How deep was the well?
9. Another caterpillar can crawl up 4 centimeters each day. Each night, he slips down 2 centimeters. How long will it take him to touch the lid of the jar that is 10 centimeters high?

**Calculator Exercises** reinforce and enrich concepts being taught.



Be smart.  
Estimate when  
you calculate.

5.  $\begin{array}{r} 593 \\ + 668 \\ \hline \end{array}$

6.  $\begin{array}{r} 386 \\ + 857 \\ \hline \end{array}$

7.  $\begin{array}{r} 2,615 \\ + 5,846 \\ \hline \end{array}$

8.  $\begin{array}{r} 6,548 \\ + 3,624 \\ \hline \end{array}$

#### Choosing a Computation Method

Add. Choose a method to find each answer. Tell which method you used. Calculator, Paper and Pencil, Mental Math, Estimation

9.  $\begin{array}{r} 8,735 \\ + 2,883 \\ \hline \end{array}$

10.  $\begin{array}{r} 6,674 \\ + 2,751 \\ \hline \end{array}$

11.  $\begin{array}{r} 4,367 \\ + 2,435 \\ \hline \end{array}$

12.  $\begin{array}{r} 2,179 \\ + 5,320 \\ \hline \end{array}$

13.  $\begin{array}{r} 3,487 \\ + 3,666 \\ \hline \end{array}$

14.  $5,636 + 2,889$

15.  $694 + 36$

16.  $385 + 15$

17.  $7,463 + 4,859$

18.  $6,878 + 8,342$

19.  $1,782 + 956$

20.  $8,127 + 386$

21.  $853 + 279$

22.  $4,680 + 7,976$

#### Apply

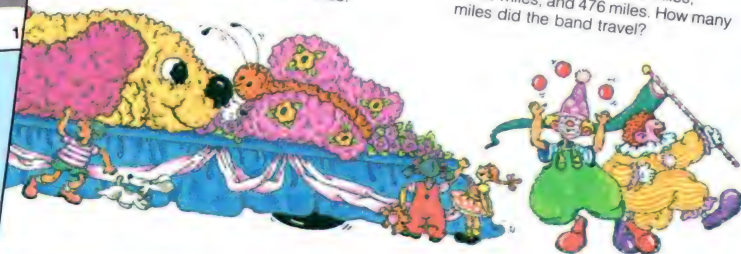
Choose a method to solve each problem. Tell which method you used. Explain to another student why you chose that method.

23. The Central High School Band traveled 1,329 miles to the Orange Bowl Parade. The return trip was 1,397 miles. How many miles did the band travel in all?

24. The Willis High School Band traveled 1,017 miles to the Cotton Bowl Parade and 895 miles home. Did the band travel more or less than 2,000 miles in all?

25. Did the Central High School Band travel farther going to the Orange Bowl Parade or returning home? Use the information in Problem 23.

26. A band on tour made trips of 524 miles, 687 miles, 321 miles, 1,029 miles, and 476 miles. How many miles did the band travel?



**Choosing a Computation Method** gives students the opportunity to select the most efficient computation method.



# P

# rofessional Support

**1. Referencing System** simplifies lesson plans. There's just one numbered objective per lesson; all the supplements are keyed to that objective with the same number.

**2. Lesson Theme** indicates how the lesson relates to other school subjects and activities, including social studies, computers, reading, recreation, health, and careers.

**3. Materials List** saves you preparation time. All the materials needed for each lesson are listed here.

**4. Error Analysis** alerts you to common student errors and provides suggestions for remediation.

**1 Objective 6** (Target Objective)  
Add three or more one-digit numbers.

**2 Lesson Theme**  
Careers: Zoo Keeper

**3 Materials**  
• Counters (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Have students make groups of several objects, such as 7 pencils, 3 pencils, and 4 pencils. Have them count how many pencils are in all three groups. Write  $7 + 3 + 4 = \square$  on the chalkboard. Point out that to find the sum, it is necessary to add more than two numbers. Suggest that when adding more than two numbers, it is often helpful to group addends that equal 10 ( $7 + 3$  in this example) before adding another number or numbers. On the chalkboard, write  $7 + 3 = 10$ . Then write  $10 + 4 = 14$ .

**Warm-Up Review** Have students review the basic addition facts for 10.  $8 + 2$ ,  $4 + 6$ ,  $1 + 9$ ,  $5 + 5$ ,  $3 + 7$

## Using the Pages

**Teach Mental Math** Have students look for addends that equal 10 as you work through Examples A and B together. The cat logo appears frequently throughout the student's text to remind students to use mental math strategies.

Other teaching examples:

$$6 + 7 + 4 [17]$$

$$2 + 1 + 8 + 5 [16]$$

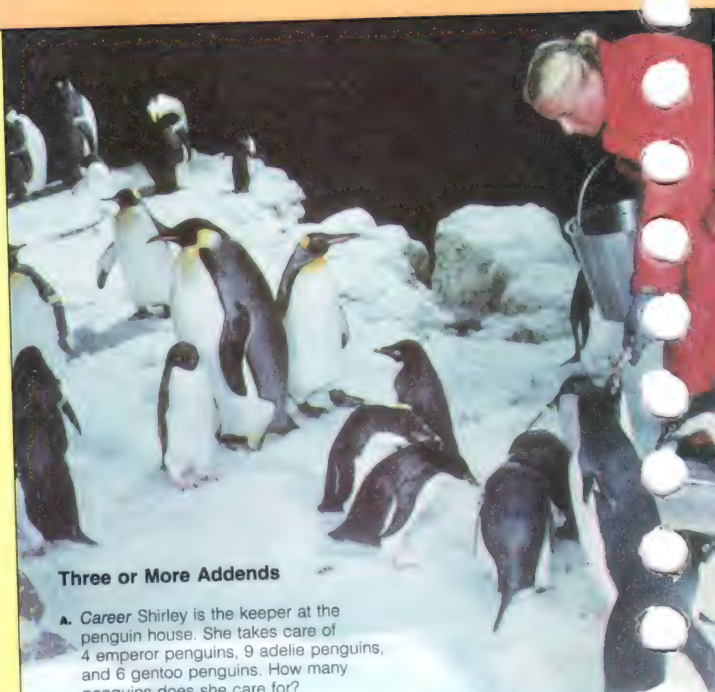
**Try** Point out that some exercises do not contain addends that equal 10, such as Exercises a and b.

**4 Practice Error Analysis** Watch for students who work the exercises too quickly and make careless errors. Have students check their answers by changing the order in which they add the numbers.

**Apply Problem Solving** Problem 21 is a multiple-step problem.

**Find a pattern** For Problem 22, you might suggest that the students show the sums of 10 like this:

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9$$



## Three or More Addends

**A. Career** Shirley is the keeper at the penguin house. She takes care of 4 emperor penguins, 9 adélie penguins, and 6 gentoo penguins. How many penguins does she care for?

Find  $4 + 9 + 6$ .

$$\begin{array}{r} 4 \\ + 9 \\ + 6 \\ \hline 19 \end{array}$$

Shirley cares for 19 penguins.



Mental Math

**B. Find  $3 + 2 + 8 + 4$ .**

$$\begin{array}{r} 3 \\ + 2 \\ + 8 \\ + 4 \\ \hline 17 \end{array}$$

## Practice 6

**Practice 6**

1. Add.

1. $1 + 2 = 3$	2. $2 + 3 = 5$	3. $3 + 4 = 7$	4. $4 + 5 = 9$
5. $5 + 6 = 11$	6. $6 + 7 = 13$	7. $7 + 8 = 15$	8. $8 + 9 = 17$

2. Which penguin ate the highest amount?

**Penguin**

Color	Amount
A. BLUE	1
B. GREEN	2
C. RED	3
D. YELLOW	4
E. PURPLE	5
F. BROWN	6
G. PINK	7
H. ORANGE	8
I. GREY	9
J. BLACK	10
K. WHITE	11
L. SILVER	12
M. GOLD	13
N. IRON	14
O. COPPER	15
P. ZINC	16
Q. ALUMINUM	17
R. STEEL	18
S. BRASS	19
T. TIN	20

## Reteaching 6

**Reteaching 6**

1. Add.

1. $1 + 2 = 3$	2. $2 + 3 = 5$	3. $3 + 4 = 7$	4. $4 + 5 = 9$
5. $5 + 6 = 11$	6. $6 + 7 = 13$	7. $7 + 8 = 15$	8. $8 + 9 = 17$

2. What happened when you ate a dessert?

3. Add. Write the sum in the space.

1. $1 + 2 = 3$	2. $2 + 3 = 5$	3. $3 + 4 = 7$	4. $4 + 5 = 9$
5. $5 + 6 = 11$	6. $6 + 7 = 13$	7. $7 + 8 = 15$	8. $8 + 9 = 17$
9. $9 + 10 = 19$	10. $10 + 11 = 21$	11. $11 + 12 = 23$	12. $12 + 13 = 25$
13. $13 + 14 = 27$	14. $14 + 15 = 29$	15. $15 + 16 = 31$	16. $16 + 17 = 33$
17. $17 + 18 = 35$	18. $18 + 19 = 37$	19. $19 + 20 = 39$	20. $20 + 21 = 41$

4. C. U. G. E. T. A. S. I. G. N. A. L.



The Teacher's Editions are organized to give you more effective teaching with less preparation time.

Try Add.

a.  $\begin{array}{r} 2 \\ 5 \\ +7 \\ \hline 14 \end{array}$  b.  $\begin{array}{r} 2 \\ 4 \\ +3 \\ \hline 9 \end{array}$  c.  $\begin{array}{r} 3 \\ 2 \\ +7 \\ \hline 12 \end{array}$  d.  $\begin{array}{r} 6 \\ 9 \\ 1 \\ +2 \\ \hline 18 \end{array}$  e.  $9 + 2 + 5 + 1 + 2 = 19$



Practice Add.

1.  $\begin{array}{r} 7 \\ 2 \\ +3 \\ \hline 12 \end{array}$  2.  $\begin{array}{r} 4 \\ 5 \\ +5 \\ \hline 14 \end{array}$  3.  $\begin{array}{r} 6 \\ 7 \\ +3 \\ \hline 16 \end{array}$  4.  $\begin{array}{r} 4 \\ 6 \\ +9 \\ \hline 19 \end{array}$  5.  $\begin{array}{r} 2 \\ 8 \\ +1 \\ \hline 11 \end{array}$  6.  $\begin{array}{r} 9 \\ 2 \\ +1 \\ \hline 12 \end{array}$   
7.  $\begin{array}{r} 3 \\ 6 \\ 3 \\ +4 \\ \hline 16 \end{array}$  8.  $\begin{array}{r} 6 \\ 2 \\ 5 \\ +4 \\ \hline 17 \end{array}$  9.  $\begin{array}{r} 3 \\ 4 \\ 5 \\ +5 \\ \hline 17 \end{array}$  10.  $\begin{array}{r} 8 \\ 2 \\ 1 \\ +3 \\ \hline 14 \end{array}$  11.  $\begin{array}{r} 1 \\ 6 \\ 3 \\ 1 \\ +2 \\ \hline 13 \end{array}$  12.  $\begin{array}{r} 4 \\ 5 \\ 3 \\ 2 \\ +1 \\ \hline 15 \end{array}$

13.  $7 + 5 + 1 = 13$  14.  $5 + 6 + 4 = 15$  15.  $7 + 1 + 6 + 3 = 17$   
16.  $2 + 2 + 3 + 9 = 16$  17.  $8 + 3 + 5 + 1 + 2 = 19$  18.  $5 + 3 + 5 + 3 + 2 = 18$

Apply Solve each problem.

19. In the morning, Nora cleaned 4 lion cages and 3 elephant cages. In the afternoon, she cleaned 6 cages. How many cages did she clean that day?  
**13 cages**
20. Sam fed 3 teaspoons of mush to a baby macaw in the morning, 4 teaspoons at noon, 5 teaspoons in the evening, and 6 teaspoons at night. How many teaspoons of mush did Sam feed to the macaw that day?  
**18 teaspoons**
21. At one zoo there are 2 polar bears. There are 3 more brown bears than polar bears, and 2 more black bears than brown bears. How many bears are at this zoo?  
**14 bears**
22. **Thinking skills** Write  $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9$ . Look for sums of 10. What is the sum of the 9 digits?  
**45**

Using Problem-Solving Strategies, page 411  
More Practice Set 6, page 354 15

## Assignment Guide

basic 1–20 odd  
average 1–22 even  
enriched 1–21 odd, 22

More Practice Set 6,  
page 354

## Follow-Up

- 7 **Extra Practice** Write a number from 1–9 on each of thirty-six 3 x 5 index cards. Give each student two or three cards face down. On your signal, have students turn over their cards and add the numbers. The student who correctly adds the numbers on his or her cards the fastest is the winner of that round. The winner gets to mix up the pile, hand out a new set of cards, and give the signal for a new round to begin.

**Enrichment Mental Math** Have students write each number below as the sum of three one-digit numbers. Encourage students to use two addends that make a sum of 10. For example:  
 $17 = 8 + 7 + 2$ .

1. 17 2. 18 3. 15 4. 10  
5. 7 6. 11 7. 12 8. 13  
9. 16 10. 9 11. 14 12. 8

## Computer Assisted Instruction

Mathematics Courseware Series  
• Addition and Subtraction 2,  
Activities 5, 6

5. **Daily Maintenance** provides a day-by-day review of content taught previously.

6. **Pictured Supplements** make it easy to identify lesson materials. Worksheets and Additional Resources from the Teacher's Resource File are shown, including math posters.

7. **Extra Practice, Reteaching, and Enrichment** ideas are provided in the lesson notes.

## Enrichment 6

6

## Additional Resource 6

## 5 Daily Maintenance

Write a family of facts using the given numbers.

1. 4, 6, 2 [ $2 + 4 = 6$ ,  $4 + 2 = 6$ ,  
 $6 - 2 = 4$ ,  $6 - 4 = 2$ ]  
2. 0, 5 [ $0 + 5 = 5$ ,  $5 + 0 = 5$ ,  
 $5 - 5 = 0$ ,  $5 - 0 = 5$ ]  
3. 16, 8 [ $8 + 8 = 16$ ,  $16 - 8 = 8$ ]  
4. 3, 5, 8 [ $3 + 5 = 8$ ,  $5 + 3 = 8$ ,  
 $8 - 3 = 5$ ,  $8 - 5 = 3$ ]  
5. 13, 6, 7 [ $6 + 7 = 13$ ,  $7 + 6 = 13$ ,  
 $13 - 7 = 6$ ,  $13 - 6 = 7$ ]  
6. 7, 15, 8 [ $7 + 8 = 15$ ,  $8 + 7 = 15$ ,  
 $15 - 7 = 8$ ,  $15 - 8 = 7$ ]

**Squares and Magic Stars** E6

Remember that a magic square has the same sum for each row, column, and diagonal. Fill in the missing numbers in these magic squares.

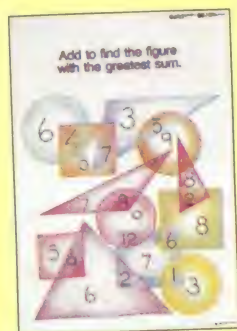
1.  $\begin{array}{|c|c|c|} \hline 9 & 4 & \\ \hline 7 & 5 & 3 \\ \hline 6 & 1 & 8 \\ \hline \end{array}$  2.  $\begin{array}{|c|c|c|} \hline 3 & 2 & 7 \\ \hline 8 & 4 & 0 \\ \hline 1 & 6 & 5 \\ \hline \end{array}$  3.  $\begin{array}{|c|c|c|} \hline 12 & 5 & 10 \\ \hline 7 & 9 & 11 \\ \hline 8 & 13 & 6 \\ \hline \end{array}$

4.  $\begin{array}{|c|c|c|} \hline 2 & 16 & 6 \\ \hline 12 & 6 & 4 \\ \hline 10 & 0 & 14 \\ \hline \end{array}$  5.  $\begin{array}{|c|c|c|} \hline 9 & 6 & 19 \\ \hline 24 & 12 & 0 \\ \hline 3 & 18 & 15 \\ \hline \end{array}$  6.  $\begin{array}{|c|c|c|} \hline 16 & 19 & 4 \\ \hline 3 & 13 & 25 \\ \hline 22 & 7 & 10 \\ \hline \end{array}$

7. **Thinking skills** The sum of the numbers on each star is the same as the sum of the numbers on the other star.

8. What is the magic sum for this star?

9. Find the missing numbers in this magic star.



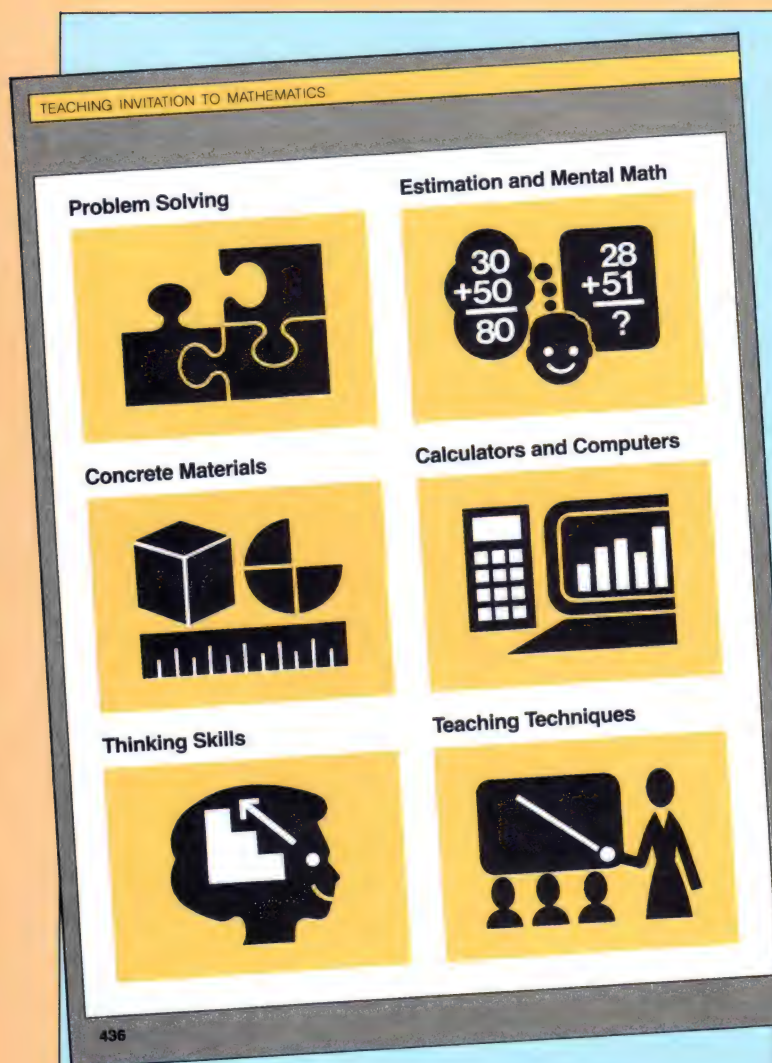
**Math Poster C Three or More Addends** The circle in the center of the poster with a sum of 29 is the figure with the greatest sum. See Answer Key for other uses.

Using Problem-Solving  
Strategies, page 411

Chapter 1 15

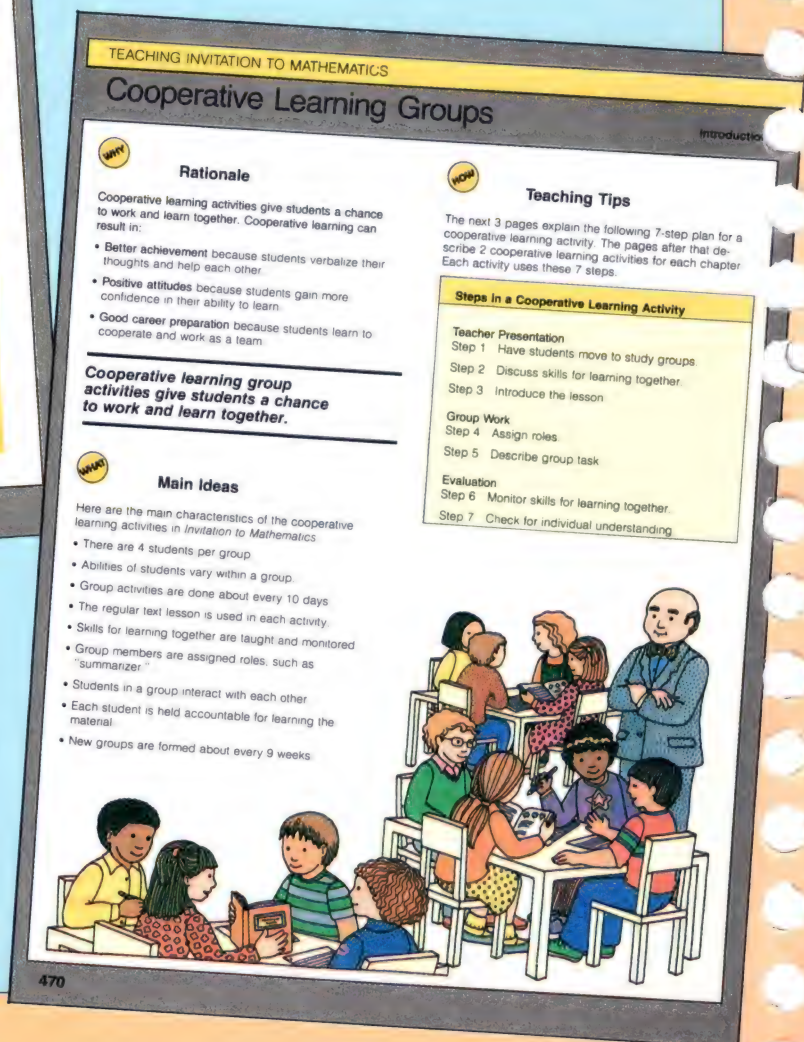


# Professional Support



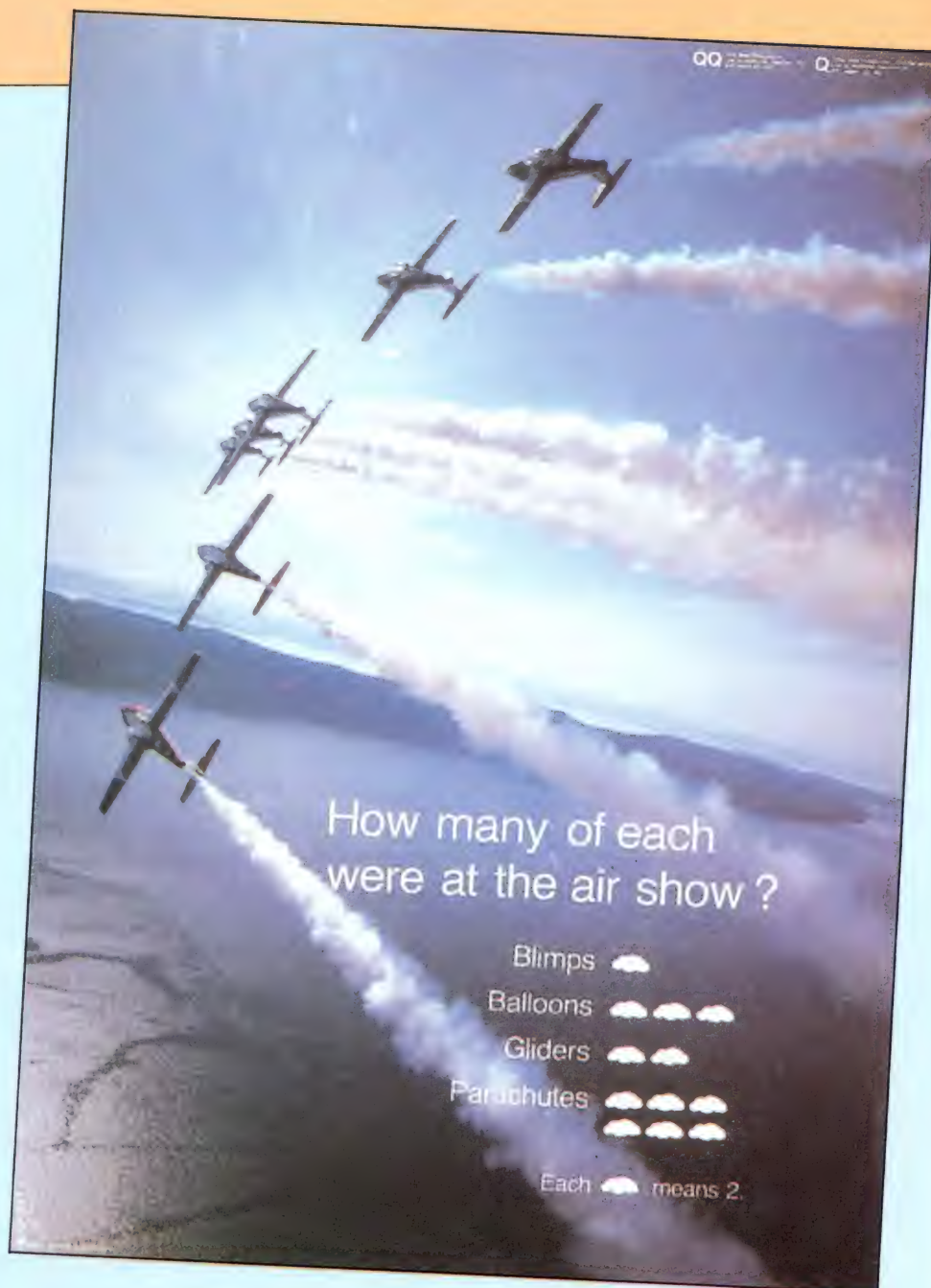
Ample aid is provided at the back of the Teacher's Edition for using the cooperative learning activities effectively. Each chapter has two activities, one for a skills lesson and one for a problem-solving lesson.

A complete professional sourcebook, located right in the Teacher's Edition, covers current topics in mathematics education.





From text features to supplements,  
Invitation to Mathematics meets  
all your teaching needs.



Actual size: 22" x 32"

### 36 Math Posters

There are 36 full-color posters for every grade level! Great for teaching displays, these posters offer plenty of practice and problem-solving opportunities.



# Supplements

## Everything you need to help students excel!

**Practice, K-8**, offers a practice worksheet for every lesson objective. Available as a workbook, or on blackline or duplicating masters.

**Reteaching, K-8**, shows the concept being taught in a simpler form. Available on blackline or duplicating masters.

**Enrichment, K-8**, extends or enriches the concept being taught for more able students. Available on blackline or duplicating masters.

**Tests, K-8**, supply alternate chapter pretests and posttests; cumulative tests 1-8; a target objectives test 1-8. Available on blackline masters in the Teacher's Resource File. Also available as a booklet or as duplicating masters.

**Problem-Solving Sourcebook Package, 1-8**, offers work on nonroutine problems and problem-solving strategies. It includes student worksheets in a tablet of blackline masters, overhead transparencies of student worksheets, and a softbound teacher sourcebook.

**Strategies in Problem-Solving Courseware Package, 3-8**, clarifies math concepts by giving students the opportunity to work with problem-solving strategies using state-of-the-art graphics.

**Test and Worksheet Generator, 5-8**, prints out customized tests and worksheets.

**Mathematics Courseware Series and Mathematics Action Games, K-8**, provide microcomputer courseware for computer-assisted instruction on key math topics.

**Computer Management System, K-8**, streamlines classroom management and record keeping with the computer.

**Answer Key for Student Texts, 3-8**, provides answers for every exercise in the Student Text.

**Cumulative Record Folder, K-8**, is helpful in recording each student's progress in skills and concepts. Packages of 40.

**Punchout Manipulatives and Manipulative Kits, K-8**, provide for hands-on experiences to enhance understanding of math concepts. Materials are keyed into the Teacher's Edition notes for easy use.

**Big Book Charts, K-1**, are available in two sets for Kindergarten: one provides Student Text pages with an acetate overlay; the other features the Teacher's Edition stories. Use as lap charts or flip charts. A Big Book at Grade 1 provides enlargements of the Teacher's Edition stories.

**Developing Language Skills in Mathematics, K-6**, provides ways to lower language barriers to learning mathematics.

**Calculators, K-8**, can be purchased separately or with Student Texts.



# Invitation to Mathematics

## *Teacher's Resource Files, K-8*

### **Your own portable filing system!**

The Teacher's Resource File is packed with helpful supplements. All items are keyed into the Teacher's Edition for easy use. Each File contains:

- 36 full-color, wall-size math posters
- maintenance worksheets
- computer and calculator worksheets
- mental math worksheets
- project worksheets
- record forms
- tests
- letters home (in English and Spanish)
- teaching aids (such as dot and graph paper)





# T ests

**A complete assessment program!**

**Chapter Tests, K-8**, in the Student Text cover all lesson objectives; the Teacher's Resource File\* offers alternate forms.

**Cumulative Tests, 1-8**, in the Student Text include 4 multiple-choice tests covering chapters 1-3, 1-6, 1-9, and 1-12; the Teacher's Resource File\* provides alternate forms.

**Target Objectives Test, 1-8**, in the Teacher's Resource File\* provides a multiple-choice test to assess mastery and prepare students for state/district competency tests.

**Placement Test, 1-8, and Readiness Worksheets, K-8**, assess new students coming into the class and provide coordinated worksheets for those who need additional practice.

**Not pictured: Computer Management System** provides blackline-master, multiple-choice chapter, cumulative, target-objective, and placement tests (available separately).

**Test and Worksheet Generator, 5-8**, prints out tailor-made, free-response tests.

\*Also available in **Test Booklet and Tests, Duplicating Masters.**

Name \_\_\_\_\_

Tell if the number in each picture is used to count, to measure, to order, or to label.

**Posttest Chapter 1**

---

Name \_\_\_\_\_

Tell if the number in each picture is used to count, to measure, to order, or to label.

**Pretest Chapter 1**

---

**Chapter 1 Test**

Tell if the number in each picture is used to count, to measure, to order, or to label.

20.  $\begin{array}{r} 15 \\ - 8 \end{array}$       21.  $\begin{array}{r} 12 \\ - 7 \end{array}$       22.  $\begin{array}{r} 18 \\ - 9 \end{array}$

Name \_\_\_\_\_

Circle the letter for the correct answer.

**Cumulative Test Chapters 1-3**

1. Which number sentence is correct?      7. What is nine hundred

**Cumulative Test, Chapters 1-3**

Give the letter for the correct answer.

1. Which number sentence is correct?

A 27 < 51      C 17 < 51  
B 7 > 15      D 71 < 37

2. Add.

$\begin{array}{r} 3 \\ + 6 \end{array}$       A 9  
B 8  
C 10  
D 3

7. Give the standard form for two hundred thirty-seven.

A 37      C 237  
B 327      D 273

8. Give the standard form for 8 000 + 200 + 11.

C 964  
D 64

C 7,105  
D 7,051

Name \_\_\_\_\_

Circle the letter for the correct answer.

**Target Objectives Test**

1. Which number sentence is correct?

A 73 > 39  
B 55 < 42  
C 75 > 78  
D 37 < 15

7. Add.

$\begin{array}{r} 3 \\ 7 \\ + 5 \end{array}$       A 13  
B 14  
C 15  
D 10

2. Which numbers are in order from least to greatest?

A 22 36 48 10

8. Add.

$5 + 2 + 9$       A 11  
B 16  
C 14  
D 17

9. Tell whether you add or

Name \_\_\_\_\_

**Readiness Worksheet A**

Add.

1.  $\begin{array}{r} 1 \\ + 7 \end{array}$       2.  $\begin{array}{r} 7 \\ + 5 \end{array}$       3.  $\begin{array}{r} 7 \\ + 3 \end{array}$       4.  $\begin{array}{r} 4 \\ + 4 \end{array}$       5.  $\begin{array}{r} 9 \\ + 5 \end{array}$

Name \_\_\_\_\_

Circle the letter for the correct answer.

**Placement Test**

1. Which number sentence is correct?

A 25 < 19  
B 26 < 41  
C 31 > 37  
D 17 > 27

7. Subtract.

$\begin{array}{r} 15 \\ - 8 \end{array}$       A 7  
B 9  
C 5  
D 11

8. Subtract.

$8 - 3$       A 11  
B 5  
C 4  
D 6

2. Which number is less than 24?

A 25      C 27

10.  $\begin{array}{r} 8 \\ + 6 \end{array}$

15.  $\begin{array}{r} 8 \\ + 3 \end{array}$

20.  $\begin{array}{r} 2 \\ + 8 \end{array}$       10



# R ecord Forms

For your convenience,  
the Teacher's Resource  
File provides 4  
optional record forms.

## Book 4 Invitation to Mathematics

### Chapters 1-6 Class Test Record Form

Names	Chapter 1	Chapter 2	Chapter 3	Cumulative Test Ch. 1-3	Chapter 4	Chapter 5	Chapter 6	Cumulative Test Ch. 1-6
1.								
2.								
3.								
4.								
5.								
6.								
7.								

**Class Test Record Form** shows class test scores for the entire year.

**Student Test Record Form** shows test scores for one student for the entire year.

**Cumulative Record Folder** shows test scores for one student for all grades, K-8. A sample is provided in the Teacher's Resource File.

**Form for Individualizing** can be used to analyze test results, make assignments, and record completed work.

Note: the **Computer Management System** offers a variety of time-saving, computer-generated reports.

Name \_\_\_\_\_

### Student Test Record Form

Book 4	Score	Pretest Percent	Date	Score	Posttest Percent	Date
Ch. 1 Addition and Subtraction Facts	/35	%		/35	%	
Ch. 2 Numbers and Place Value	/30	%		/30	%	
Ch. 3 Addition and Subtraction	/25	%		/25	%	
Cumulative Test Chapters 1-3	/22	%		/22	%	

### Cumulative Record Folder

Name \_\_\_\_\_

Kindergarten	Score	Pretest Percent	Date	Score	Posttest Percent	Date
Ch. 1 Shapes Comparison	/11	%		/11	%	
Ch. 2 The Numbers 0 Through 5	/17	%		/17	%	
Ch. 3 The Numbers 6 Through 10	/15	%		/15	%	
Ch. 4 Measurement	/11	%		/11	%	
Ch. 5 Geometry Patterns, Fractions	/8	%		/8	%	
Ch. 6 Readiness for Addition and Subtraction	/9	%		/9	%	
Ch. 7 The Numbers Through 12, Time, Money	/11	%		/11	%	

Book 1	Score	Pretest Percent	Date	Score	Posttest Percent	Date
Ch. 1 The Numbers 0 Through 6	/18	%		/18	%	
Ch. 2 Addition Facts Through 6	/30	%		/30	%	
Ch. 3 The Numbers 7 Through 12	/24	%		/24	%	
Cumulative Test Chapters 1-3	/15	%		/15	%	
Ch. 4 Addition Facts for 7 Through 12	/57	%		/57	%	
Ch. 5 Measurement	/12	%		/12	%	
Ch. 6 Subtraction Facts Through 8	/38	%		/38	%	
Cumulative Test						

Book 2	Score	Pretest Percent	Date	Score	Posttest Percent	Date
Ch. 1 Numbers and Addition Facts Through 10	/39	%		/39	%	
Ch. 2 Numbers and Addition Facts Through 18	/40	%		/40	%	
Ch. 3 Measurement	/13	%		/13	%	
Cumulative Test Chapters 1-3	/15	%		/15	%	
Ch. 4 Subtraction Facts Through 10	/43	%		/43	%	
Ch. 5 Subtraction Facts Through 18	/52	%		/52	%	
Ch. 6 Place Value Numbers to 100	/20	%		/20	%	

Name \_\_\_\_\_

### Chapter 5 Form for Individualizing

Multiplication Facts		Text		Supplements	
Objectives		Lesson Pages	More Practice Pages 367-370	Practice Page	Enrichment Page
45. Write addition and multiplication equations	122-123	Set 45	45	45	45
46. Write products for multiplication facts using 2 or 3 as a factor	124-125	Set 46	46	46	46
47. Write products for multiplication facts using 2 through 5 as factors	126-127	Set 47	47	47	47
48. Write products for multiplication facts using 2 through 6 as factors	128-129	Set 48	48	48	48
49. Write products for multiplication facts using 0 through 6 as factors	132-133	Set 49	49	49	49
50. Write products for multiplication facts using 0 through 7 as factors	134-135	Set 50	50	50	50
51. Write products for multiplication facts using 0 through 8 as factors	136-137	Set 51	51	51	51
52. Write products for multiplication facts using 0 through 9 as factors	138-139	Set 52	52	52	52

Test Record			
Pretest date		Posttest date	
Score _____ out of 34. _____ %		Score _____ out of 34. _____ %	
Obj	Items	Needs help	Obj
45	1 2		45
46	3 4 5 6 7		46
	8		
47	9 10 11 12 13		47
	14		
48	15 16 17		48
49	18 19 20 21 22		49
	23		
50	24 25 26		50
51	27 28 29		51

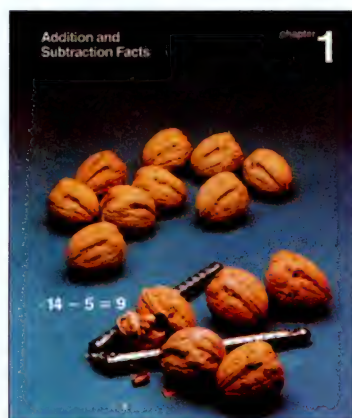


# Objectives

Lesson objectives are shown here with asterisks used to indicate target objectives. Students must have reasonable competence with target objectives in order to experience success with the book for the following grade. A target objectives test is provided in the Teacher's Resource File.

## Chapter 1 Addition and Subtraction Facts

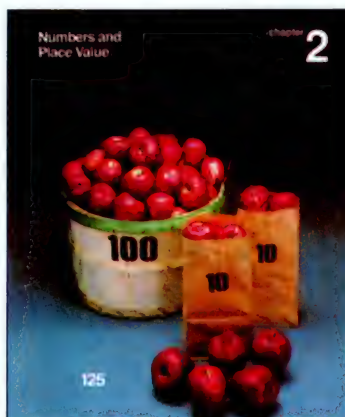
- 1 Identify uses of numbers.
- \*2 Compare and order numbers less than 100 using  $<$  and  $>$ .
- \*3 Write sums for addition facts.
- \*4 Write differences for subtraction facts.
- 5 Identify addition and subtraction sentences that belong to a family of facts.
- \*6 Add three or more one-digit numbers.



- \*7 Solve problems by choosing addition or subtraction facts.
- 8 Find missing addends.

## Chapter 2 Numbers and Place Value

- 9 Write one-digit and two-digit numbers.
- 10 Write numbers and give the place value for any digit in a number through 999.
- \*11 Write numbers and give the place value for any digit in a number through 9,999.
- 12 Compare numbers less than 10,000.
- 13 Order numbers and give a number that is 10, 100, or 1,000 greater than a given number.
- \*14 Round a number to the nearest ten or nearest hundred.
- 15 Round a number to the nearest hundred or nearest thousand.



- 16 Solve problems by using a table.
- 17 Write numbers through 999,999 and give the place value for any digit in a number through 999,999.
- 18 Write numbers and give the place value for any digit in a number through 999,999,999.
- 19 Choose sensible answers to problems.

## Chapter 3 Addition and Subtraction

- 20 Estimate the sum of two numbers and add numbers with up to four digits with no renaming.
- 21 Rename a number with up to four digits when the number of ones, tens, or hundreds is greater than 9.



- 22 Add two numbers with up to four digits with one renaming.
- \*23 Add two numbers with up to four digits with more than one renaming.
- \*24 Add three or more numbers with up to four digits.
- 25 Estimate the difference of two numbers and subtract numbers with up to four digits with no renaming.
- 26 Rename numbers with up to four digits to show more hundreds, tens, or ones.
- 27 Subtract numbers with up to four digits with one renaming.
- \*28 Subtract numbers with up to four digits with more than one renaming.
- 29 Subtract numbers with up to four digits involving consecutive renamings with zeros.
- 30 Add or subtract numbers with up to four digits and check the answers.
- 31 Add or subtract amounts of money.
- 32 Solve problems by writing equations involving addition and subtraction.



#### Chapter 4 Measurement

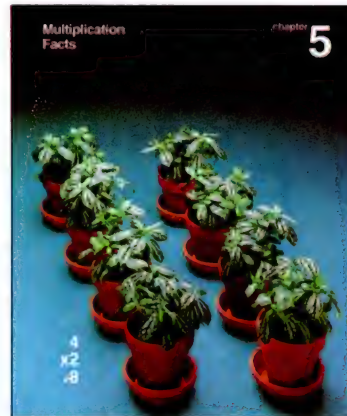
- \*33 Tell time using standard and digital clocks.
- \*34 Read and interpret a calendar.
- 35 Measure objects to the nearest centimeter and choose an appropriate measure of length using centimeter or decimeter.
- 36 Choose an appropriate measure of length using centimeter, decimeter, meter, or kilometer.



- 37 Choose an appropriate measure of weight (mass) using gram or kilogram.
- 38 Choose an appropriate measure of capacity using milliliter or liter.
- 39 Solve problems by estimating distances.
- 40 Measure objects to the nearest inch and choose the appropriate measure of length using inch or foot.
- 41 Choose an appropriate measure of length using inch, foot, yard, or mile.
- 42 Choose an appropriate measure of weight using ounce, pound, or ton.
- 43 Choose an appropriate measure of capacity using cup, pint, quart, or gallon.
- 44 Choose an appropriate temperature using degrees Celsius or degrees Fahrenheit.

#### Chapter 5 Multiplication Facts

- 45 Write addition and multiplication equations.
- 46 Write products for multiplication facts using 2 or 3 as factors.



- 47 Write products for multiplication facts using 2 through 5 as factors.
- 48 Write products for multiplication facts using 2 through 6 as factors.
- 49 Write products for multiplication facts using 0 through 6 as factors.
- 50 Write products for multiplication facts using 0 through 7 as factors.
- 51 Write products for multiplication facts using 0 through 8 as factors.
- \*52 Write products for multiplication facts using 0 through 9 as factors.
- 53 Write problems involving addition, subtraction, and multiplication.

#### Chapter 6 Multiplication

- 54 Multiply a one- or a two-digit number and a multiple of 10, 100, or 1,000.
- 55 Multiply a two-, a three-, or a four-digit number and a one-digit number with no renaming.
- \*56 Multiply a two-, a three-, or a four-digit number and a one-digit number with one renaming.
- 57 Solve problems by finding a pattern.
- 58 Multiply a three- or a four-digit number and a one-digit number with more than one renaming.
- \*59 Multiply a three- or a four-digit number containing zeros by a one-digit number.
- 60 Multiply numbers that are multiples of 10, 100, or 1,000.

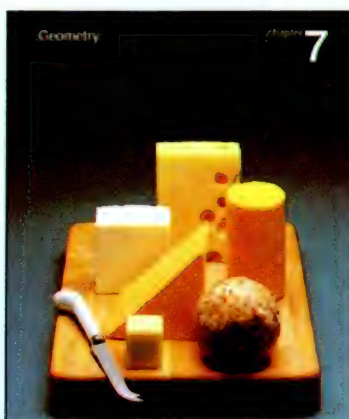


- 61 Estimate the product of two numbers.
- 62 Multiply a two-digit number and a two-digit number.
- 63 Multiply a three-digit number and a two-digit number.
- 64 Multiply an amount of money by a one- or a two-digit number.
- 65 Solve problems by choosing addition, subtraction, or multiplication.



## Chapter 7 Geometry

- 66 Identify parallel and intersecting lines and give the names of segments.
- 67 Identify right angles and give the names of angles.
- 68 Identify polygons and give the numbers of sides and angles in polygons.
- 69 Identify congruent segments and polygons.
- 70 Identify parallelograms, rectangles, and squares.
- 71 Find perimeters.
- 72 Find areas by counting square centimeters.



- 73 Solve problems involving areas of triangles by using pictures.
- 74 Identify center, radius, and diameter of a circle.
- 75 Identify lines of symmetry.
- 76 Identify spheres, cones, rectangular prisms, cylinders, and cubes.
- 77 Find volumes by counting cubic centimeters.

## Chapter 8 Division Facts

- 78 Write a division equation to show the number in each group or the number of groups.
- 79 Write quotients for division facts using 2 or 3 as the divisor.
- 80 Write quotients for division facts using 2 through 5 as divisors.
- \*81 Write quotients for division facts involving 0 and 1.
- 82 Write quotients for division facts using 1 through 6 as divisors.
- 83 Write quotients for division facts using 1 through 7 as divisors.
- 84 Write quotients for division facts using 1 through 8 as divisors.



- \*85 Write quotients for division facts using 1 through 9 as divisors, and identify multiplication and division sentences that belong to a family of facts.
- 86 Solve multiple-step problems.
- \*87 Divide a two-digit number by a one-digit number to get a one-digit quotient with a remainder.
- \*88 Solve problems by choosing addition, subtraction, multiplication, or division.

## Chapter 9 Division

- \*89 Divide a two-digit number by a one-digit number to get a two-digit quotient.
- 90 Divide a two-digit number by a one-digit number to get a two-digit quotient with a zero in the ones place.



- 91 Divide a three-digit number by a one-digit number to get a three-digit quotient.
- 92 Divide a three-digit number by a one-digit number to get a three-digit quotient with a zero in the tens or ones place.
- 93 Divide a two- or a three-digit number by a one-digit number to get a one-, two-, or three-digit quotient.
- 94 Divide an amount of money by a one-digit number.
- 95 Solve problems by interpreting remainders.
- 96 Find averages.
- 97 Divide a two- or a three-digit number by a multiple of 10 to get a one-digit quotient.
- 98 Divide a two- or a three-digit number by a two-digit number to get a one-digit quotient.
- 99 Correct one-digit estimates that are too large.
- 100 Divide a three-digit number by a two-digit number to get a two-digit quotient.
- 101 Solve word problems by writing equations involving multiplication or division.



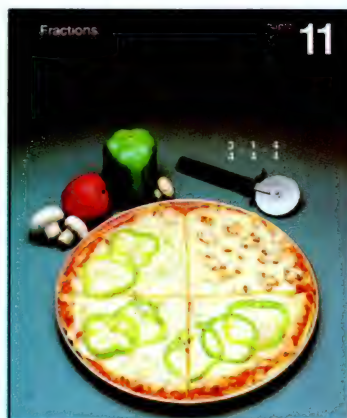
## Chapter 10 Decimals

- 102 Write decimals involving tenths.
- \*103 Write decimals involving tenths and hundredths.
- \*104 Write decimals and give the place value for any digit in decimals through hundredths.
- 105 Write decimals for amounts of money.
- 106 Compare decimals through hundredths.
- 107 Add decimals through hundredths.
- 108 Subtract decimals through hundredths.
- 109 Solve problems by choosing addition or subtraction of decimals.
- 110 Solve problems with too much information.



## Chapter 11 Fractions

- \*111 Write a fraction for part of a whole.
- \*112 Write a fraction for part of a set.
- 113 Compare two fractions and compare a fraction with 1.



- 114 Write mixed numbers and/or improper fractions.
- 115 Write fractions or mixed numbers to give lengths of objects to the nearest fourth inch.
- 116 Find the number of objects in a fractional part of a set.
- 117 Solve problems by drawing pictures to find fractional parts.
- 118 Add fractions with the same denominator.
- 119 Find equal fractions by using pictures and number lines.
- 120 Add fractions with different denominators by using a number line.
- 121 Subtract fractions with the same denominator.
- 122 Subtract fractions with different denominators by using a number line.

## Chapter 12 Graphing

- 123 Read and interpret pictographs.
- 124 Read and interpret bar graphs.
- 125 Read and interpret broken-line graphs.
- 126 Identify number pairs for points on a grid and identify points on a grid for number pairs.
- 127 Locate points for ordered pairs.
- 128 Solve problems by reading graphs.





# Target Objectives

Students must have reasonable competence with target objectives in order to experience success with the book for the following grade. A target objectives test is provided in the Teacher's Resource File.

## **Chapter 1 Addition and Subtraction Facts**

- \* 2 Compare and order numbers less than 100 using  $<$  and  $>$ .
- \* 3 Write sums for addition facts.
- \* 4 Write differences for subtraction facts.
- \* 6 Add three or more one-digit numbers.
- \* 7 Solve problems by choosing addition or subtraction facts.

## **Chapter 2 Numbers and Place Value**

- \*11 Write numbers and give the place value for any digit in a number through 9,999.
- \*14 Round a number to the nearest ten or nearest hundred.

## **Chapter 3 Addition and Subtraction**

- \*23 Add two numbers with up to four digits with more than one renaming.
- \*24 Add three or more numbers with up to four digits.
- \*28 Subtract numbers with up to four digits with more than one renaming.

## **Chapter 4 Measurement**

- \*33 Tell time using standard and digital clocks.
- \*34 Read and interpret a calendar.

## **Chapter 5 Multiplication Facts**

- \*52 Write products for multiplication facts using 0 through 9 as factors.

## **Chapter 6 Multiplication**

- \*56 Multiply a two-, a three-, or a four-digit number and a one-digit number with one renaming.
- \*59 Multiply a three- or a four-digit number containing zeros by a one-digit number.

## **Chapter 8 Division Facts**

- \* 81 Write quotients for division facts involving 0 and 1.
- \* 85 Write quotients for division facts using 1 through 9 as divisors, and identify multiplication and division sentences that belong to a family of facts.
- \* 87 Divide a two-digit number by a one-digit number to get a one-digit quotient with a remainder.
- \* 88 Solve problems by choosing addition, subtraction, multiplication, or division.

## **Chapter 9 Division**

- \* 89 Divide a two-digit number by a one-digit number to get a two-digit quotient.

## **Chapter 10 Decimals**

- \*103 Write decimals involving tenths and hundredths.
- \*104 Write decimals and give the place value for any digit in decimals through hundredths.

## **Chapter 11 Fractions**

- \*111 Write a fraction for part of a whole.
- \*112 Write a fraction for part of a set.



# Pacing Chart

		Basic	Average	Enriched
<b>Chapter 1</b> <b>Addition and Subtraction Facts</b>	Long-term problem-solving projects*	2	3	3
	Using Numbers (2–3)			
	Comparing and Ordering Numbers (4–5)			
	Addition Basic Facts (6–7)	4	3	3
	Subtraction Basic Facts (8–9)			
	Using Problem-Solving Strategies (10–11)			
	Families of Facts (12–13)			
	Three or More Addends (14–15)			
	Problem Solving: Choose the Operation (16–17)	3	3	2
	Missing Addends (18–19)			
	Challenge: Number Patterns (21)	—	—	1
	Review and Chapter 1 Test (20)	2	2	2
	Total	11 days	11 days	11 days
<b>Chapter 2</b> <b>Numbers and Place Value</b>	Long-term problem-solving projects*	2	3	3
	Digits and Numbers (24–25)			
	Hundreds, Tens, and Ones (26–27)	3	2	2
	Thousands (28–29)			
	Comparing Numbers (30–31)			
	Ordering Numbers (32–33)			
	Rounding: Nearest Ten and Nearest Hundred (34–35)	4	4	3
	Rounding: Nearest Hundred and Nearest Thousand (36–37)			
	Using Problem-Solving Strategies (38–39)			
	Problem Solving: Use a Table (40–41)			
	Ten-Thousands and Hundred-Thousands (42–43)			
	Millions (44–45)	3	3	3
	Problem Solving: Give Sensible Answers (46–47)			
	Challenge: Billions (49)	—	—	1
	Review and Chapter 2 Test (48)	2	2	2
	Total	14 days	14 days	14 days
<b>Chapter 3</b> <b>Addition and Subtraction</b>	Long-term problem-solving projects*	2	3	3
	Estimating Sums: Mental Math (52–53)			
	Renaming for Addition (54–55)			
	Addition: One Renaming (56–57)			
	Addition: More Than One Renaming (58–59)	5	4	4
	Addition: Three or More Addends (60–61)			
	Practice: Addition (62–63)			
	Estimating Differences: Mental Math (64–65)			
	Renaming for Subtraction (66–67)			
	Subtraction: One Renaming (68–69)			
	Subtraction: More Than One Renaming (70–71)	5	5	5
	Subtraction: Renaming with Zeros (72–73)			
	Using Problem-Solving Strategies (74–75)			
	Checking Addition and Subtraction (76–77)			
	Addition and Subtraction of Money (78–79)			
	Practice: Addition and Subtraction (80–81)	2	2	2
	Problem Solving: Write and Equation (82–83)			
	Mental Math Strategies (85)	1	1	1
	Review and Chapter 3 Test (84)	2	2	2
	Cumulative Test: Chapters 1–3 (87–88)	1	1	1
	Total	18 days	18 days	18 days

\*For long-term problem-solving projects, you might use the *Situational Lessons* at the beginning of chapters. You might also use some of the *Using Problem-Solving Strategies* pages, the *Project* worksheets, and suggestions in the lesson notes. You may wish to spread a long-term project over part or all of the chapter, spending some time each day.



		Basic	Average	Enriched
<b>Chapter 4 Measurement</b>	Long-term problem-solving projects*	2	3	3
	Time: Clock (90–91)			
	Time: Calendar (92–93)			
	Centimeter and Decimeter (94–95)			
	Meter and Kilometer (96–97)	5	5	5
	Gram and Kilogram (98–99)			
	Milliliter and Liter (100–101)			
	Practice: Metric Measures (102–103)			
	Problem Solving: Use Estimation (104–105)			
	Inch and Foot (106–107)			
	Yard and Mile (108–109)			
	Ounce, Pound, and Ton (110–111)	5	4	4
	Cup, Pint, Quart, and Gallon (112–113)			
	Using Problem-Solving Strategies (114–115)			
	Temperature: Celsius and Fahrenheit (116–117)			
<b>Chapter 5 Multiplication Facts</b>	Estimation Strategies (119)	1	1	1
	Review and Chapter 4 Test (118)	2	2	2
	Total	15 days	15 days	15 days
	Long-term problem-solving projects*	2	3	3
	Meaning of Multiplication (122–123)			
	2 and 3 in Multiplication (124–125)			
	4 and 5 Multiplication (126–127)	4	4	3
	6 in Multiplication (128–129)			
	Using Problem-Solving Strategies (130–131)			
	0 and 1 in Multiplication (132–133)			
	7 in Multiplication (134–135)			
	8 in Multiplication (136–137)			
	9 in Multiplication (138–139)	5	4	4
	Practice: Multiplication Facts (140–141)			
	Problem Solving: Write a Problem (142–143)			
<b>Chapter 6 Multiplication</b>	Challenge: Multiples (145)	—	—	1
	Review and Chapter 5 Test (144)	2	2	2
	Total	13 days	13 days	13 days
	Long-term problem-solving projects*	2	3	3
	Multiplying Tens, Hundreds, and Thousands: Mental Math (148–149)			
	Multiplication: No Renaming (150–151)	4	3	3
	Multiplication One Renaming (152–153)			
	Problem Solving: Find a Pattern (154–155)			
	Multiplication: More Than One Renaming (156–157)			
	Multiplication: Renaming with Zeros (158–159)			
	Practice: Multiplication (160–161)	3	3	3
	Multiplying Multiples of 10: Mental Math (162–163)			
	Estimating Products: Mental Math (164–165)			
	Multiplication: Two-Digit Numbers (166–167)			
	Multiplication: Two-Digit and Three-Digit Numbers (168–169)			
<b>Chapter 6 Multiplication</b>	Using Problem-Solving Strategies (170–171)	3	3	3
	Multiplication: Money (172–173)			
	Problem Solving: Choose the Operation (174–175)			
	Choosing a Computation Method (177)	1	1	1
	Review and Chapter 6 Test (176)	2	2	2
	Cumulative test: Chapters 1–6 (179–180)	1	1	1
	Total	16 days	16 days	16 days

\*For long-term problem-solving projects, you might use the *Situational Lessons* at the beginning of chapters. You might also use some of the *Using Problem-Solving Strategies* pages, the *Project* worksheets, and suggestions in the lesson notes. You may wish to spread a long-term project over part or all of the chapter, spending some time each day.



		Basic	Average	Enriched
<b>Chapter 7 Geometry</b>	Long-term problem-solving projects*	2	3	3
	Points, Lines, and Segments (182–183)			
	Angles (184–185)			
	Polygons (186–187)			
	Congruence (188–189)			
	Parallelograms (190–191)	6	5	5
	Perimeter (192–193)			
	Area (194–195)			
	Using Problem-Solving Strategies (196–197)			
	Problem Solving: Use a Picture (198–199)			
	Circles (200–201)			
	Symmetry (202–203)	4	4	3
	Three-Dimensional Figures (204–205)			
	Volume (206–207)			
<b>Chapter 8 Division Facts</b>	Challenge: Drawing Similar Figures (209)	—	—	1
	Review and Chapter 7 Test (208)	2	2	2
	Total	14 days	14 days	14 days
	Long-term problem-solving projects*	2	3	3
	Meaning of Division (212–213)			
	Dividing by 2 and 3 (214–215)			
	Dividing by 4 and 5 (216–217)	4	4	3
	1 and 0 in Division (218–219)			
	Deciding When an Estimate Is All You Need (220–221)			
	Dividing by 6 (222–223)			
	Dividing by 7 (224–225)			
	Dividing by 8 (226–227)			
	Dividing by 9 (228–229)			
	Problem Solving: Multiple-Step Problems (230–231)	6	5	5
<b>Chapter 9 Division</b>	Using Problem-Solving Strategies (232–233)			
	Remainders (234–235)			
	Problem Solving: Choose the Operation (236–237)			
	Challenge: Missing Factors (239)	—	—	1
	Review and Chapter 8 Test (238)	2	2	2
	Total	14 days	14 days	14 days
	Long-term problem-solving projects*	2	3	3
	One-Digit Divisors, Two-Digit Quotients (242–243)			
	Zeros in two-Digit Quotients (244–245)			
	One-Digit Divisors, Three-Digit Quotients (246–247)			
	Zeros in Three-Digit Quotients (248–249)	6	5	5
	Placing Digits in the Quotient (250–251)			
	Dividing Money (252–253)			
	Practice: Division (254)			
<b>Chapter 9 Division</b>	Problem Solving: Interpreting Remainders (256–257)			
	Finding Averages (258–259)			
	Multiples of 10 as Divisors (260–261)	4	4	3
	Two-Digit Divisors, One-Digit Quotients (262–263)			
	Correcting Estimates in One-Digit Quotients (264–265)			
	Two-Digit Divisors, Two-Digit Quotients (266–267)			
	Using Problem-Solving Strategies (268–269)	3	3	3
	Problem Solving: Write an Equation (270–271)			
	Challenge: Divisibility, Even Numbers and Odd Numbers (273)	—	—	1
	Review and Chapter 9 Test (272)	2	2	2
	Cumulative Test: Chapters 1–9 (275–276)	1	1	1
	Total	18 days	18 days	18 days

\*For long-term problem-solving projects, you might use the *Situational Lessons* at the beginning of chapters. You might also use some of the *Using Problem-Solving Strategies* pages, the *Project* worksheets, and suggestions in the lesson notes. You may wish to spread a long-term project over part or all of the chapter, spending some time each day.



		Basic	Average	Enriched
<b>Chapter 10 Decimals</b>	Long-term problem-solving projects*	2	3	3
	Tenths (278–279)			
	Hundredths (280–281)			
	Place Value (282–283)	5	4	3
	Money as Hundredths (284–285)			
	Comparing Decimals (286–287)			
	Addition: Tenths and Hundredths (288–289)			
	Subtraction: Tenths and Hundredths (290–291)			
	Problem Solving: Choose the Operation (292–293)	3	3	3
	Using Problem-Solving Strategies (294–295)			
	Problem Solving: Too Much Information (296–297)			
	Challenge: Rounding Decimals (299)	—	—	1
<b>Chapter 11 Fractions</b>	Review and Chapter 10 Test (298)	2	2	2
	Total	12 days	12 days	12 days
	Long-term problem-solving projects*	2	3	3
	Fractions: Part of a Whole (302–303)			
	Fractions: Part of a Set (304–305)			
	Comparing Fractions (306–307)			
	Mixed Numbers (308–309)	5	4	4
	Fractions in Measurement (310–311)			
	Finding Fractional Parts (312–313)			
	Problem Solving: Use a Picture (314–315)			
	Addition: Same Denominator (316–317)			
	Equal Fractions (318–319)			
<b>Chapter 12 Graphing</b>	Addition: Different Denominators (320–321)	5	5	4
	Subtraction: Same Denominator (322–323)			
	Subtraction: Different Denominators (324–325)			
	Using Problem-Solving Strategies (326–327)			
	Challenge: Probability (329)	—	—	1
	Review and Chapter 11 Test (328)	2	2	2
	Total	14 days	14 days	14 days
	Long-term problem-solving projects*	2	3	3
	Pictographs (332–333)			
	Bar Graphs (334–335)			
	Broken-Line Graphs (336–337)	3	2	2
	Using Problem-Solving Strategies (338–339)			
<b>Chapter 12 Graphing</b>	Points on a Grid (340–341)			
	Graphing Number Pairs (342–343)			
	Problem Solving: Use a Graph (344–345)			
	Challenge: Making a Bar Graph (347)	—	—	1
	Review and Chapter 12 Test (346)	2	2	2
	Cumulative Test: Chapter 1–12 (349–350)	1	1	1
	Total	11 days	11 days	11 days
	Total—Chapters 1–12	170 days	170 days	170 days

\*For long-term problem-solving projects, you might use the *Situational Lessons* at the beginning of chapters. You might also use some of the *Using Problem-Solving Strategies* pages, the *Project* worksheets, and suggestions in the lesson notes. You may wish to spread a long-term project over part or all of the chapter, spending some time each day.



# Scope and Sequence Chart

## Numbers and Numeration

	K	1	2	3	4	5	6	7	8
Numbers									
Comparing									
Ordering									
Patterns and sequences									
Counting									
Place value									
Rounding									
Factors									
Multiples									
Least common multiple									
Greatest common factor									
Exponents									
Primes and composites									
Prime factorization									

### Grade 3

Writing numbers  
 • In standard form, 30–33, 46–47, 50–51  
 • In expanded form, 30–31, 46–47

Ordinal numbers 4–5

Place value  
 • Ones, tens, hundreds, 30–31  
 • **Thousands, 46–47**  
 • **Ten-thousands, 50–51**  
 • **Hundred-thousands, 50–51**  
 • **Millions, 55 (Challenge)**

Comparing  
 • 1- and 2-digit numbers, 6–7  
 • 2- and 3-digit numbers, 34–35  
 • **4-digit numbers, 48–49**

Ordering  
 • 1- and 2-digit numbers, 8–9  
 • 2- and 3-digit numbers, 36–37  
 • **4-digit numbers, 48–49**

Patterns/sequences, 174–175

Counting by twos, fives, and tens, 42–43

Renaming, 60–61, 92–93

**Rounding to the nearest ten, 40–41**

**Ordered pairs, 288–289**

**Factors, 158–159**

Even and odd numbers, 281 (Challenge)

### Grade 4

Writing numbers  
 • In standard form, 26–29, 38, 42–45  
 • In expanded form, 28–29  
 • **In words, 26–29, 42–45**

Place value  
 • Ones, tens, hundreds, 26–27  
 • Thousands, 28–29  
 • Ten-thousands, 42–43  
 • Hundred-thousands, 42–43  
 • Millions, 44–45  
 • **Billions, 49 (Challenge)**

Comparing  
 • 1- and 2-digit numbers, 4–5  
 • 3- and 4-digit numbers, 30–31

Ordering  
 • 1- and 2-digit numbers, 4–5  
 • 3- and 4-digit numbers, 32–33

Patterns/sequences, 21, 154–155

Renaming, 54–55, 66–67

Rounding  
 • Nearest ten, 34–35, 81  
 • **Nearest hundred, 34–37, 81**  
 • **Nearest thousand, 36–37, 81**

Ordered pairs, 340–343

Factors, 124–125

Even and odd numbers, 273 (Challenge)

**Multiples, 145 (Challenge)**

### Grade 5

Writing numbers  
 • In standard form, 2–5  
 • In expanded form, 2–3  
 • In words, 2–5

Place value  
 • Through thousands, 2–3  
 • **Through hundred-billions, 4–5**

Comparing, 6–7

Ordering, 6–7

Patterns/sequences, 314–315

Rounding numbers, 10–11

Ordered pairs, 348–349

Factors, 42–43

Multiples, 42–43

**Roman numerals, 119 (Challenge)**

**Note**  
 Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



# Scope and Sequence Chart

## Addition of Whole Numbers

	K	1	2	3	4	5	6	7	8
Meaning									
Basic facts									
Add, no renaming									
Add, 1 renaming									
Add, 3 or more addends									
Add, more than 1 renaming									
Estimating sums									
Properties									

Grade 3	Grade 4	Grade 5
Meaning, 10–11	Meaning, 6–7	Basic facts, 12–13
Basic facts, 10–13, 20–21	Basic facts, 6–7	Families of facts, 12–13
Families of facts, 22–23	Families of facts, 12–13	Computation
Computation with no renaming, 58–59	Renaming, 54–55	• One renaming, 16–17
Renaming, 60–61	Computation	• More than one renaming, 18–19
Computation with one renaming	• One renaming, 56–57, 62–63, 80	• Three or more addends, 20–21
• Renaming ones, 62–65	• More than one renaming, 58–59, 62–63, 80	• Money, 32–33
• Renaming tens, 66–67	• Three or more addends, 60–62, 80	Estimating sums, 14–15, 16, 18, 20, 30
• Three or more addends, 70–71, 74–75	• Money, 78–79	Missing addends, 36–37
• Renaming hundreds, 72–75	Estimating sums, 52–53, 58	Properties
• Money, 140–141	Missing addends, 18–19	• Commutative, 39
Computation with more than one renaming, 76–77, 116–117	Associative property, 14–15	• Associative, 39
• Three or more addends, 76–77	Commutative property, 6–7, 57, 69	
Estimating sums, 62, 68–69, 72, 78–79, 116		
Missing addends, 27 (Challenge)		

**Note**  
Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



## Subtraction of Whole Numbers

	K	1	2	3	4	5	6	7	8
Meaning									
Basic facts									
Subtract, no renaming									
Subtract, 1 renaming									
Subtract, more than 1 renaming									
Subtract, involving zeros									
Estimating differences									

### Grade 3

Meaning, 16–17  
 Basic facts, 16–21  
 Families of facts, 22–23  
 Computation with no renaming, 90–91, 100–101  
 Renaming, 92–93  
 Computation with one renaming,  
 • Renaming tens, 94–97, 100–101  
 • Renaming hundreds, 98–101  
 • Four-digit numbers, 102–103  
 • Checking, 114–115  
 • Money, 140–141  
 Computation with more than one renaming, 104–105, 112–117  
 Renaming with zeros, 108–109, 112–117  
 Estimating differences, 96, 102, 110–112, 116  
 Missing addends, 27 (Challenge)

### Grade 4

Meaning, 8–9  
 Basic facts, 8–9  
 Families of facts, 12–13  
 Renaming, 66–67  
 Computation  
 • One renaming, 68–69, 80  
 • More than one renaming, 70–71, 80  
 • With zeros, 72–73, 80  
 • Checking, 76–77, 80  
 • Money, 78–79  
 Estimating differences, 64–65, 68, 70, 72  
 Missing addends, 18–19

### Grade 5

Basic facts, 12–13  
 Families of facts, 12–13  
 Computation  
 • One renaming, 24–25  
 • More than one renaming, 26–27  
 • With zeros, 28–29  
 • Checking, 24–25  
 • Money, 32–33  
 Estimating differences, 22–23, 24, 26, 28  
 Missing addends, 36–37



# Scope and Sequence Chart

## Multiplication of Whole Numbers

	K	1	2	3	4	5	6	7	8
Meaning									
Basic facts									
Factors									
Multiplying by a 1-digit factor									
Multiplying by a 2-digit factor									
More than 2 factors									
Estimating products									
Multiples									
Multiplying by a 3-digit factor									
Properties									
Least common multiple									
Greatest common factor									
Prime factorization									

### Grade 3

Meaning, 152–153  
Related to addition, 152–153  
**Basic facts with a factor**  
• Of 2, 154–155, 162–163  
• Of 3, 156–157, 162–163  
• Of 4, 158–159, 162–163  
• Of 5, 160–163  
• Of 0 or 1, 166–167  
• Of 6, 168–169  
• Of 7, 170–171  
• Of 8 or 9, 172–173  
**Families of facts, 264–265**  
**Multiplying with 10 and 100, 184–185**  
**Multiplying with a one-digit factor**  
• Multiples of 10 and 100, 186–187  
• No renaming, 188–189  
• One renaming 190–191  
• Two-digit numbers, 188–191, 194–195, 200–201  
• Three-digit numbers, 198–201  
**Estimating products, 188, 190, 194, 196, 198, 202**  
**Factors, 158–159**  
**Missing factors, 259 (Challenge)**

### Grade 4

Meaning, 122–123  
Related to addition, 122–123  
**Basic facts**  
• Of 2 and 3, 124–125  
• Of 4 and 5, 126–127  
• Of 6, 128–131, 140–141  
• Of 0 and 1, 132–133, 140–141  
• Of 7, 134–135, 140–141  
• Of 8, 136–137, 140–141  
• Of 9, 138–141  
**Families of facts, 228–229**  
**Multiplying by**  
• 10 and 100, 148–149  
• 1,000, 148–149  
**Multiplying with a one-digit factor**  
• Multiples of 10 and 100, 162–163  
• Multiples of 1,000, 162–163  
• No renaming, 150–151, 160–161  
• One renaming, 152–153, 160–161  
• With zeros, 158–161  
• More than one renaming, 156–157, 160–161  
**Estimating products, 150–152, 156, 158, 164–165, 166–169, 172, 192**  
**Multiplying with a two-digit factor**  
• Two-digit number, 166–167  
• Three-digit number, 168–169  
**Money, 172–173**  
**Factors, 124–125**  
**Missing factors, 239 (Challenge)**  
**Three factors, 148–149**  
**Multiples, 145 (Challenge)**  
**Commutative property, 126–127, 267**  
• Associative property, 148–149

### Grade 5

**Basic facts, 42–43**  
**Families of facts, 70–71**  
**Computation**  
• Multiples of 10, 100, and 1,000, 44–45  
• With a one-digit factor, 48–49  
• By a multiple of 10, 52–53  
• With a two-digit factor, 54–55  
• Money, 60–61  
• Three factors, 50–51  
• **With a three-digit factor, 62–63**  
**Estimating products, 46–47, 48, 55, 60, 62, 64**  
**Factors, 42–43**  
**Greatest common factor, 221**  
**Missing factors, 116–117**  
**Multiples, 42–43**  
**Least common multiple, 278**  
**Properties**  
• Commutative, 67  
• Associative, 67  
• Distributive, 67

**Note**  
Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



## Division of Whole Numbers

	K	1	2	3	4	5	6	7	8
Meaning									
Basic facts									
1-digit divisor, 1-digit quotient									
1-digit divisor, 2-digit quotient									
1-digit divisor, 3-digit quotient									
Averages									
Interpret the remainder									
2-digit divisor, 1-digit quotient									
2-digit divisor, 2-digit quotient									
2-digit divisor, 3-digit quotient									
2-digit divisor, 4-digit quotient									
3-digit divisor									
Estimating quotients									

### Grade 3

Meaning, 232–233, 266–267

Basic facts with a divisor or quotient

- Of 2, 234–235
- Of 3, 236–237
- Of 4, 238–239
- Of 5, 240–241
- Of 6, 246–247, 254–255
- Of 7, 248–249, 254–255
- Of 8, 250–251, 254–255
- Of 9, 252–255
- Of 0 or 1, 256–257

Families of facts, 264–265

Dividing by a one-digit number

- One-digit quotients, 268–271
- Two-digit quotients, 272–275

Remainders, 266–271, 274–275

Estimating quotients, 268

Missing factors, 259 (Challenge)

### Grade 4

Meaning, 212–213

Basic facts with a divisor or quotient

- Of 2 or 3, 214–215, 220–221
- Of 4 or 5, 216–217, 220–221
- Of 0 or 1, 218–221
- Of 6, 222–223
- Of 7, 224–225
- Of 8, 226–227
- Of 9, 228–229

Families of facts, 228–229

Dividing by a one-digit number

- One-digit quotients, 234–235, 250–251, 254
- Two-digit quotients, 242–245, 250–251, 254
- Three-digit quotients, 246–249, 254
- Zeros in the quotient, 244–245, 248–249, 254
- Checking, 242–245
- Averages, 258–259
- Money, 252–253

Dividing by a two-digit number

- Multiples of 10, 260–261
- One-digit quotients, 262–263
- Two-digit quotients, 266–267
- Correcting estimates, 264–265

Estimating quotients, 234–235, 244, 250–252, 256, 266

Remainders, 234–235

Interpret the remainder, 256–257

Missing factors, 239 (Challenge)

### Grade 5

Basic facts, 70–71

Families of facts, 70–71

Dividing by a one-digit number

- One-digit quotients, 72–73
- Two-digit quotients, 74–75
- Three-digit quotients, 76–77
- Zeros in the quotient, 78–79
- Checking, 72–75
- Averages, 84–85
- Money, 86–87

• Short division, 91 (Challenge)

Dividing by a two-digit number

- One-digit quotients, 96–101
- Two-digit quotients, 102–105
- Three-digit quotients, 108–109
- Zeros in the quotient, 110–112
- Correcting estimates, 98–101, 104–105

Estimating quotients, 74, 76, 78, 82, 86, 102, 106, 108, 110, 114

Checking, 96–97

Remainders, 72–73

Interpret the remainder, 106–107, 236–237

Missing factors, 116–117

Mixed-number quotients, 234–237



# Scope and Sequence Chart

## Meaning of Decimals

	K	1	2	3	4	5	6	7	8
Place value, tenths, hundredths									
Comparing									
Fractions and decimals									
Equal decimals									
Rounding decimals									
Place value, thousandths									
Changing fractions to decimals									
Ordering									
Repeating decimals									
Place value, millionths									
Percents and decimals									
Terminating decimals									
Rational numbers									

Grade 3	Grade 4	Grade 5
Place value • Tenths, 324–325 • Tenths and hundredths, 326–327 Comparing, 328–329 Decimals in measurement, 330–331 Related to fractions, 324–327, 330–331, 333	Place value • Tenths, 278–279, 282–283 • Hundredths, 280–283 Comparing, 286–287 Finding equal decimals, 286–287 Related to fractions, 278–281, 302–303 Rounding decimals, 299 (Challenge)	Place value • Tenths, 122–123, 128–129 • Hundredths, 124–125, 128–129 • Thousandths, 126–129 Comparing, 130–131 Finding equal decimals, 130–131 Ordering, 132–133 Related to fractions, 122–123, 124–125, 126–127, 244–245 Rounding decimals, 145 (Challenge) Changing fractions to decimals, 247 (Challenge) Repeating decimals, 247 (Challenge)

**Note**  
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## Decimal Computation

	K	1	2	3	4	5	6	7	8
Adding									
Subtracting									
Estimating sums/differences									
Multiplying by a whole number									
Multiplying by a decimal									
Multiplying, zero in the product									
Multiplying by a power of 10									
Estimating products/quotients									
Dividing by a whole number									
Dividing by a decimal									
Dividing by a power of 10									
Rounding quotients									
Rational numbers									

### Grade 4

Adding tenths and hundredths,  
288–289

Subtracting tenths and  
hundredths, 290–291

Estimating sums and differences,  
289

### Grade 5

Adding, 134–135

Subtracting, 136–137

Multiplying

- By a whole number, 150–151
- By a decimal, 152–153
- With zeros in the product,  
154–155
- By 10, 100, or 1000, 157

Estimating sums, differences, or  
products, 134, 136, 165



# Scope and Sequence Chart

## Meaning of Fractions and Mixed Numbers

	K	1	2	3	4	5	6	7	8
Part of a whole									
Part of a set									
Fractions in measurement									
Fractions and decimals									
Comparing fractions, same denominator									
Comparing fractions, different denominator									
Finding equal fractions									
Meaning of mixed numbers									
Mixed numbers as quotients									
Mixed numbers as improper fractions									
Comparing mixed numbers									
Lowest terms									
Least common denominator									
Fractions and percents									
Rational numbers									

### Grade 3

Part of a whole, 314–315

Part of a set, 316–317

Finding fractional parts, 320–321

Comparing, 322–323

Fractions in measurement, 330–331

Related to decimals, 324–327, 330–331, 333

### Grade 4

Part of a whole, 302–303

Part of a set, 304–305

Finding fractional parts, 312–313

Fractions

• Equal fractions, 318–319  
• On the number line, 306–307, 318–321, 324–325

• Comparing with same denominator, 306–307

• Comparing with different denominators, 306–307  
• In measurement, 310–311

Mixed numbers

• Meaning, 308–309  
• In measurement, 310–311

Related to decimals, 278–281, 302–303

### Grade 5

Part of a whole, 212–213

Part of a set, 214–215

Equal fractions, 216–217

Finding equal fractions, 218–219

Lowest terms, 220–221

Fractions

• In measurement, 232–233  
• On the number line, 226–227  
• Comparing, 224–227, 230–231

Mixed numbers

• Meaning, 222–223  
• In measurement, 232–233  
• On the number line, 226–227  
• As quotients, 234–235  
• As improper fractions, 238–239  
• Improper fractions as, 240–241  
• Comparing with same denominator, 224–225  
• Comparing with different denominators, 230–231

Common denominator, 228–229

Least common denominator, 228–229

Related to decimals, 213, 235, 244–245, 288, 290

Changing fractions to decimals, 247 (Challenge)

#### Note

Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



## Fraction and Mixed Number Computation

	K	1	2	3	4	5	6	7	8
Adding fractions									
Subtracting fractions									
Adding mixed numbers									
Subtracting mixed numbers									
Estimating sums/differences									
Multiplying fractions and mixed numbers									
Dividing fractions and mixed numbers									
Estimating products/quotients									
Rational numbers									

### Grade 3

Adding and subtracting, same denominator, 335 (Challenge)

### Grade 4

Adding

- Same denominator, no renaming, 316–317

- Different denominators using the number line, 320–321

Subtracting

- Same denominator, 322–323

- Different denominators using the number line, 324–325

### Grade 5

Adding fractions

- Same denominator, 272–273
- Different denominators, 278–279, 282–283

Adding mixed numbers

- Same denominator, 274–275
- Renaming sums, 276–277
- Different denominators, 280–283
- Three addends, 282–283
- Estimating sums, 274, 276

Subtracting fractions

- Same denominator, 286–287
- Different denominators, 292–293

Subtracting mixed numbers

- Same denominator, no renaming, 286–287
- Same denominator with renaming, 290–291
- Different denominators, no renaming, 294–295
- From a whole number, 288–289
- Estimating differences, 290

Multiplying

- Using a picture, 250–251
- Fractions, 252–253
- With whole numbers, 254–255
- Mixed numbers, 260–261
- Shortcut, 267 (Challenge)
- Fractions in probability, 258–259
- Estimating products, 260



# Scope and Sequence Chart

## Measurement, Time, and Money

		K	1	2	3	4	5	6	7	8
Measurement	Perimeter									
	Area									
	Metric units of measurement									
	Customary units of measurement									
	Volume									
	Angle measurement									
	Surface area									
Time	Time									
	Calendar									
	Elapsed time									
Money	Penny, nickel, and dime									
	Quarter									
	Half-dollar and dollar									
	Adding and subtracting money									
	Multiplying and dividing money									

### Grade 3

- Metric units
  - Centimeter, 208–209
  - Meter and kilometer, 210–211
  - Gram and kilogram, 212–213
  - Liter, 214–215
  - Milliliter, 214–215
  - Degrees Celsius, 229 (Challenge)
  - Square centimeter, 298–299

- Customary units
  - Inch, 218–219
  - Foot, yard, and mile, 220–221
  - Ounce, 222–223
  - Pound, 222–223
  - Cup, pint, quart, and gallon, 224–225
  - Degrees Fahrenheit, 229 (Challenge)

Perimeter, 296–297, 299

- Area
  - By counting, 298–299
  - Irregular shapes, 298–299

Volume by counting, 308–309

- Time
  - Telling time, 124–129
  - Elapsed time, 144–145

Digital and standard clocks, 124–129

Calendar, 130–133

Time before the hour, 149 (Challenge)

- Money
  - Pennies, dimes, dollars, 136–137
  - Nickels, quarters, half-dollars, 138–139
  - Adding and subtracting 140–141
  - Making change, 142–143

### Grade 4

- Metric units
  - Centimeter, 94–95
  - Decimeter, 94–95
  - Meter and kilometer, 96–97
  - Gram and kilogram, 98–99
  - Milliliter and liter, 100–101
  - Degrees Celsius, 116–117
  - Square centimeter, 194–195, 198–199
  - Cubic centimeter, 206–207

- Customary units
  - Inch, foot, yard, and mile, 106–109
  - Ounce and pound, 110–111
  - Ton, 110–111
  - Cup, pint, quart, and gallon, 112–113
  - Degrees Fahrenheit, 116–117

Perimeter, 192–193

- Area
  - By counting, 194–195
  - Irregular shapes, 194–195
  - Triangles, 198–199

Volume by counting, 206–207

- Time
  - Telling time, 90–91
  - Elapsed time, 90–91

Digital and standard clocks, 90–91

Calendar, 92–93

- Money
  - Adding and subtracting, 78–79
  - Multiplying, 172–173
  - Dividing, 252–253

### Grade 5

- Metric units
  - Centimeter, decimeter, meter, and kilometer, 170–173
  - Millimeter, 170–173
  - Liter and milliliter, 180–181
  - Gram and kilogram, 182–183
  - Degrees Celsius, 204–205
  - Equivalent measures, 172–173, 180–183
  - Square centimeter, 176–177
  - Cubic centimeter, 178–179

- Customary units
  - Inch, foot, yard, and mile, 186–189
  - Cup, pint, quart, and gallon, 194–195
  - Ounce, pound, and ton, 196–197
  - Degrees Fahrenheit, 204–205
  - Adding and subtracting, 206–207
  - Equivalent measures, 188–189, 194–197
  - Square inch, 190–191
  - Cubic inch, 192–193

Perimeter, 174–175

Circumference, 314–315

- Area
  - By counting, 176–177, 190–191
  - By multiplying, 326–329
  - Squares and rectangles, 326–327
  - Triangles, 328–329
  - Irregular shapes, 330–331

- Volume
  - By counting, 178–179, 192–193
  - By multiplying, 334–335

Angle measurement, 308–311

Elapsed time, 202–203

Money, 32–33, 60–61, 86–87

**Note**  
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## Geometry

	K	1	2	3	4	5	6	7	8
Circles									
Polygons									
Three-dimensional shapes									
Congruence									
Symmetry									
Angles									
Similar figures									
Points, lines, segments									
Parallel and intersecting lines									
Rays and perpendicular lines									
Planes									
Constructions									
Right-triangle geometry									

### Grade 3

Polygons  
 • Rectangle, square, triangle, 290–291  
 • Pentagon, hexagon, octagon, 290–291  
 Circles, 290–291  
 Congruence of figures, 292–293  
 Angles  
 • Recognizing, 294–295  
 • Right, 294–295  
 Three-dimensional shapes, 306–307  
 Symmetry, 304–305  
 Area, perimeter, volume:  
 See Measurement

### Grade 4

Points, lines, segments, parallel lines, intersecting lines, 182–183  
 Polygons  
 • Triangle, 186–187  
 • Quadrilateral, 186–187  
 • Pentagon, hexagon, octagon, 186–187  
 • Parallelogram, 190–191  
 Circles  
 • Radius, 200–201  
 • Diameter, 200–201  
 • Center, 200–201  
 Congruence  
 • Of figures, 188–189  
 • Of segments, 188–189  
 Three-dimensional shapes, 204–205  
 Angles  
 • Naming, 184–185  
 • Right, 184–185  
 Symmetry, 202–203  
 Similar figures, 209 (Challenge)  
 Area, perimeter, volume:  
 See Measurement

### Grade 5

Points, lines, segments, parallel lines, intersecting lines, 304–305  
 Rays, 304–305  
 Perpendicular lines, 310–311  
 Polygons, 316–317  
 Circles  
 • Radius, diameter, center, 312–315  
 • Central angle, 312–315  
 • Circumference, 314–315  
 Congruence  
 • Of figures, 322–323  
 • Of segments, 322–323  
 • Of angles, 310–311  
 Three-dimensional shapes, 332–333  
 Angles  
 • Measuring and drawing, 308–311  
 • Naming, 306–307  
 • Right, 306–307  
 • Acute and obtuse, 306–307  
 • Sums of the angles of a triangle, 318–319  
 • Central angles, 312–313  
 Symmetry, 320–321  
 Similar figures, 324–325  
 Area, perimeter, volume:  
 See Measurement



# Scope and Sequence Chart

## Graphing, Statistics, and Probability

		K	1	2	3	4	5	6	7	8
Graphing	Bar graphs/pictographs									
	Ordered pairs									
	Broken-line graphs									
	Line graphs									
	Circle graphs									
	Graphing in 4 quadrants									
	Graphing equations									
Statistics	Use a graph									
	Averages									
	Mean, median, mode									
	Scattergrams									
	Interpreting statistics									
Probability	Recording outcomes									
	Listing possible outcomes									
	Probability experiments									
	Predicting outcomes									
	Independent and dependent events									

### Grade 3

- Graphing
  - Bar graphs, 284–287, 311
  - Pictographs, 284–287
  - Ordered pairs, 288–291
- Statistics
  - Use a graph, 286–287
  - **Collecting data, 311 (Challenge)**
- Probability
  - Recording outcomes, 311 (Challenge)

### Grade 4

- Graphing
  - Bar graphs, 334–335
  - Pictographs, 332–333
  - **Broken-line graphs, 336–337**
  - **Line graphs, 344–345**
  - Ordered pairs, 340–343
- Statistics
  - Use a graph, 344–345
  - Collecting data, 335, 347 (Challenge)
  - **Averages, 258–259**
- Probability
  - **Listing possible outcomes, 329 (Challenge)**

### Grade 5

- Graphing
  - Bar graphs, 344–345
  - Pictographs, 324–343
  - Broken-line graphs, 346–347, 369
  - Line graphs, 350–353
  - Ordered pairs, 348–349
- Statistics
  - Use a graph, 350–351
  - Collecting data, 369 (Challenge)
  - Averages, 84–85
- Probability
  - Listing possible outcomes, 58–59
  - **Predicting outcomes, 258–259**
  - **Finding probability, 258–259**
  - **Probability experiments, 256–259**

#### Note

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## Pre-Algebra

	K	1	2	3	4	5	6	7	8
Equations and Expressions	Write a number sentence/equation								
	Missing addends								
	Missing factors								
	Order of operations								
	Inequalities								
	Missing minuends								
	Missing dividends								
	Algebraic solutions								
	Evaluating expressions								
Positive and Negative Numbers	Meaning								
	Comparing and ordering								
	Adding and subtracting								
	Multiplying and dividing								
	Graphing								
	Rational and real numbers								

### Grade 3

#### Equations

- Write a number sentence, 118–119, 196–197
- Missing addends, 27 (Challenge)
- Missing factors, 259 (Challenge)

### Grade 4

#### Equations

- Write an equation, 82–83, 270–271
- Missing addends, 18–19
- Missing factors, 239 (Challenge)

### Grade 5

#### Equations

- Write an equation, 30–31, 82–83
- Missing addends, 36–37
- Missing factors, 116–117
- Proportions, 364–365



# Scope and Sequence Chart

## Ratio and Proportion

	K	1	2	3	4	5	6	7	8
Meaning									
Equal ratios									
Cross-products									
Solving proportions									
Tangent, sine, and cosine									



### Grade 5

Meaning, 354–355

Equal ratios

• Meaning, 356–357

• Multiplying to find, 358–359

Cross-products, 362–363

Solving proportions, 364–365

## Percent

	K	1	2	3	4	5	6	7	8
Meaning									
Percents and decimals									
Percents and fractions									
Percents greater than 100% or less than 1%									
Finding a percent of a number									
Finding what percent one number is of another									
Finding a number when a percent of it is known									
Estimating									

Percent begins in Grade 6.

### Note

Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



## Applications

		K	1	2	3	4	5	6	7	8
Students' Everyday World	Home activities									
	Recreation									
	School activities									
Other School Subjects	Social studies									
	Health									
	Science									
	Music									
	Reading									
	Art									
	Consumer topics									
Preparation for Adult Life	Careers									
	Computers									
	Technology									

### Grade 3

Home activities, 10–13, 58–61, 132–133, 136–139, 202–203, 294–295, 298–299, 320–323, 330–331

Recreation, 42–43, 76–79, 82–83, 92–93, 130–131, 152–153, 160–161, 166–169, 172–173, 208–209, 218–219, 234–237, 286–287, 292–293

School activities, 2–5, 48–49, 62–67, 116–117, 134–135, 146–147, 232–233, 256–257, 274–275, 278–279

Social studies, 30–31, 34–37, 40–41, 52–53, 102–105, 108–111, 210–211, 220–221, 284–285, 288–291

Health, 46–47, 50–51, 212–215, 222–225, 264–265

Science, 6–7, 90–91, 196–199, 216–217, 244–253

Music, 24–25, 170–171

Reading, 70–73, 124–129, 184–187

Art, 154–157, 302–305, 314–317

Consumer topics, 16–19, 140–143, 164–165, 238–241, 268–269, 272–273, 306–307, 318–319, 324–327

Careers, 32–33, 194–195, 266–267, 296–297

Computers, 96–99, 188–191

Technology, 158–159

### Grade 4

Home activities, 124–127, 204–205, 244–245

Recreation, 2–9, 18–19, 34–35, 68–71, 96–97, 108–109, 156–159, 172–173, 188–189, 228–231, 234–237, 242–243, 278–279, 292–293, 312–313

School activities, 16–17, 24–27, 52–53, 76–77, 122–123, 132–133, 220–221, 256–263, 314–315, 332–337

Social studies, 28–29, 36–37, 40–45, 72–73, 82–83, 148–149, 152–153, 186–187, 192–193, 222–227

Health, 106–107, 134–135, 280–281, 306–309

Science, 64–65, 100–101, 202–203, 270–271, 342–343

Music, 46–47, 56–59

Reading, 104–105, 246–249, 288–291, 322–325

Art, 138–139, 194–195, 198–199, 212–219, 316–317, 320–321

Consumer topics, 94–95, 110–111, 136–137, 142–143, 162–165, 182–185, 250–253, 284–285, 296–297, 302–305

Careers, 14–15, 60–61, 98–99, 128–129, 150–151, 166–167, 282–283

Computers, 78–79, 166–169

Technology, 30–33, 174–175, 200–201, 264–267, 310–311

### Grade 5

Home activities, 180–181, 186–191, 194–197, 212–213, 216–217, 364–365

Recreation, 10–13, 30–31, 64–65, 70–73, 82–83, 86–87, 96–99, 102–105, 122–123, 130–133, 138–139, 170–177, 200–201, 230–231, 282–283, 294–295, 304–305

School activities, 8–9, 74–79, 256–259, 314–315, 344–347

Social studies, 4–7, 26–29, 50–51, 234–235, 250–255, 298–299, 306–307, 320–321

Health, 182–283, 214–215, 286–287, 292–293, 358–359

Science, 44–47, 116–117, 152–253, 156–157, 222–227, 260–261, 264–265, 342–343, 350–351, 360–361

Music, 36–37, 218–219

Reading, 14–17, 88–89, 114–115, 134–137, 238–241, 278–281

Art, 18–21, 274–277, 290–291, 308–309, 324–325

Consumer topics, 22–23, 32–33, 58–61, 110–111, 124–125, 142–143, 154–155, 160–163, 262–263, 326–327, 330–331

Careers, 24–25, 42–43, 48–49, 54–55, 62–63, 106–107, 150–151, 232–233, 236–237, 288–289, 322–323, 362–363

Computers, 52–55, 202–207, 332–335

Technology, 2–3, 108–109, 126–129, 148–149, 352–353



# Scope and Sequence Chart

## Problem Solving

		K	1	2	3	4	5	6	7	8
Read	Use data from a picture									
	Too much or too little information									
	Use data from a graph									
	Use data from a table									
	Write a problem									
Plan (Strategies)	Find a pattern									
	Choose the operation									
	Write a number sentence/equation									
	Make a table									
	Try and check									
	Draw a picture or a diagram									
	List all possibilities									
	Work backward									
	Use physical models									
	Use logical reasoning									
	Make a graph									
	Use estimation									
	Solve a simpler problem									
	Use ratios									
	Use a formula									
	Choose a computation method									
	Interpret the remainder									
	Give sensible answers									
Solve										
Answer										
Look Back										

### Note

Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



### Grade 3

#### Read

- Use data from a picture, 17, 33, 75, 208–209, 216–219, 233, 293, 303, 323, 325
- Too much information, 82–83, 202–203
- Use data from a graph, 284–285, 287, 289
- Use data from a table, 48, 91, 111
- **Write a problem, 21, 65, 91, 139, 163, 219, 237, 269, 291, 319**

#### Plan (Strategies)

- Find a pattern, 14–15, 38–39, 56, 144–145, 174–177, 179, 192–193, 206, 226–227, 251, 276–277, 281, 300–301, 332–333, 398, 404, 407
- Choose the operation, 24–25, 106–107, 164–165, 242–245, 278–279
- Write a number sentence/equation, 118–119, 196–197, 242–243
- Make a table, 23, 35, 38–39, 65, 180, 206, 311, 397, 398, 404, 406, 407, 411, 412
- Try and check, 14–15, 86, 176–177, 192–193, 213, 260, 267, 276–277, 309, 312, 332–333, 399, 402, 406, 408, 411–413, 416
- Draw a picture or a diagram, 28, 144–145, 175, 180, 201, 230, 267, 276–277, 282, 319, 336, 394, 398, 404, 407, 411, 415
- List all possibilities, 56, 80–81, 86, 127, 144–145, 176–177, 226–227, 260, 267, 276–277, 282, 396, 403, 406, 408, 411, 413, 416
- Work backward, 27, 106–107, 150, 400, 405, 409, 417
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#### Solve

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#### Solve

- Choose a computation method, 57, 59, 79, 99, 111, 135, 139, 153, 159, 169, 177, 193, 217, 225, 245, 254, 263, 289, 291, 398–409

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## Estimation

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Estimation Strategies in Measurement	Making reasonable guesses								
	Comparing to something with a known measure								
	Sampling and predicting								
	Reading graphs and tables								
Estimation Strategies in Computation	Using rounding								
	Using front-end digits								
	Substituting compatible numbers								
	Using a range								
	Using clustering								
	Comparing to a reference point								
Estimation in Problem Solving	Giving sensible answers								
	Using estimation								
	Choosing when to use estimation								

### Grade 3

#### Measurement

- Making reasonable guesses, 208–209, 211–215, 221–223, 225
- Comparing to something with a known measure, 216–217, 302–303
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#### Computation

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#### Note

Red type identifies new topics and black type identifies topics introduced earlier in the program. The page numbers indicate where an idea or skill is presented and/or used.



## Mental Math

### Basic-Fact Strategies

		K	1	2	3	4
Addition	Commutative property					
	Counting on					
	Using doubles					
	Adding 0					
	Adding 8 or 9					
Subtraction	Families of facts					
	Counting back					
	Counting up					
	Subtracting 0					
	Subtracting 8 or 9					
Multiplication	Commutative property					
	Skip counting					
	Adding on to a known product					
	Doubling					
	Multiplying by 9					
Division	Families of facts					

### Computation Strategies

	K	1	2	3	4	5	6	7	8
Looking for special numbers									
Using compensation									
Breaking apart numbers									
Using equivalent forms									
Choosing when to compute mentally									

#### Grade 3

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#### Grade 4

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- Counting on, 6–7
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- Adding 0, 6–7
- Adding 8 or 9, 6–7

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- Families of facts, 12–13
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Multiplication basic-fact strategies

- Commutative property, 126–127, 267
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# Scope and Sequence Chart

## Calculators

	K	1	2	3	4	5	6	7	8
How to Operate a Calculator									
Reading a display									
Number and operation keys									
Special keys									
Using Calculators									
Using calculators to reinforce concepts									
Using calculators in problem solving									
Choosing when to use a calculator									

### Grade 3

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Using calculators in problem solving, 35, 63, 69, 75, 101, 133, 141, 147, 189, 197, 213, 225, 269, 296

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### Grade 5

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Special keys, 85

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Using calculators in problem solving, 5, 7, 9, 117, 127, 189, 195, 265, 299, 347

Choosing when to use a calculator, 19, 21, 25, 29, 33, 45, 53, 55, 61, 63, 73, 77, 79, 87, 99, 103, 109, 111, 135, 137, 181, 197, 235, 291, 301, 327, 335, 414–425

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## Computers

		K	1	2	3	4	5	6	7	8
Computer Awareness	Uses of computers									
	Capabilities of computers									
	Careers with computers									
	Parts of computers									
	History of computers									
Programming in BASIC	PRINT statements									
	GOTO statements									
	REM statements									
	INPUT statements									
	LET statements									
	IF . . . THEN statements									
	FOR . . . NEXT statements									
	READ . . . DATA statements									
	TAB, INT, RND, SQR functions									
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Programming in Logo	CS or DRAW command									
	REPEAT command									

### Grade 3

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- Programming in Logo
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- Computer awareness
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  - CS or DRAW command, AR 120, AR 128
  - REPEAT command, 337, AR 128



# Scope and Sequence for Computer-Assisted Instruction

## Mathematics Courseware Series

Package	Content	K	1	2	3	4	5	6	7	8
Addition and Subtraction 1	+, −, basic facts through 9									
Addition and Subtraction 2	+, −, basic facts through 18									
Numeration 1	Place value through 3 digits									
Addition and Subtraction 3	+, −, 2-digit and 3-digit numbers									
Fractions 1	Meaning of fractions, mixed numbers									
Numeration 2	Place value through 9 digits									
Multiplication 1	×, basic facts									
Multiplication 2	×, 1-digit multipliers									
Division 1	÷, basic facts									
Division 2	÷, 1-digit divisors									
Decimals 1	Meaning of decimals, +, −									
Addition and Subtraction 4	+, −, up to 5-digit numbers									
Multiplication 3	×, 2-digit and 3-digit multipliers									
Fractions 2	+, −, fractions, like denominators									
Fractions 3	+, −, fractions, unlike denominators									
Division 3	÷, 2-digit divisors									
Decimals 2	×, decimals									
Fractions 4	+, −, mixed numbers									
Fractions 5	×, ÷, fractions, mixed numbers									
Decimals 3	÷, decimals									
Percent 1	Meaning of percent									
Percent 2	The cases of percent									

## Mathematics Action Games

Package	Content	K	1	2	3	4	5	6	7	8
Frog Jump	Counting and ordering numbers									
Picture Parts	+, −, ×, basic facts									
Pyramid Puzzler	×, multiplies of 10, 100, 1,000									
Star Maze	÷, basic facts, 1-digit divisors									
Number Bowling	Meaning of decimals, fractions									
Space Journey	Meaning of percent									

## Strategies in Problem Solving

Package	Strategies	K	1	2	3	4	5	6	7	8
Dinosaurs and Squids	Make a table, draw a diagram									
Spinners and Slugs	Make a table, draw a diagram									



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- 8 Subtraction Basic Facts
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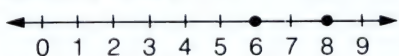
# chapter 1

## Addition and Subtraction Facts

### Mathematical Background

#### Use and Comparison of Numbers

Numbers have many uses which can serve as models for solving problems. When comparing numbers, for example, the symbols "<" and ">" mean "less than" and "greater than," respectively. Why is  $8 > 6$ ? If counting is being used,  $8 > 6$  because you have to count further to reach 8. If a number line is used, then  $8 > 6$  because 8 is farther to the right on the number line.



**Addition** Addition involves both a knowledge of basic facts and an understanding of the concept. In learning the basic facts, the terms being added (*addends*) should be recognized, whether shown horizontally or vertically.

Eventually the basic facts should become automatic, but many children still need to *count on* to determine the sum. The *commutative property of addition* means that the order in which the addends are written has no effect on the sum, and for many this can be useful. For example, the addition problem  $1 + 9$  is difficult if a student must count on 9, but is easier if he has to count on only 1.

The *additive identity* 0 is an important number, because using 0 as one addend means that the sum is equal to the other addend.

**Subtraction** Subtraction usually has two meanings. One is derived from the notion that if some objects are removed from a set of objects, the number of objects remaining is the difference. Here is an example:

Mary has 10 counters and gives 3 counters to her brother. How many does she have left?

The other meaning comes from comparing two quantities. As an example:

Mary has 10 counters and her brother has 3 counters. How many more does Mary have than her brother?

Both meanings should be understood.

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Using Numbers	2-3
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### Pretest for Chapter 1

Available in the *Teacher's Resource File* (as a blackline master), in *Tests*, *Duplicating Masters*, and in *Test Booklet*.

Name: \_\_\_\_\_

**Pretest Chapter 1**

Tell if the number in each picture is used to count, to measure, to order, or to label.

1. 2.

3. Write a number sentence to compare 7 and 33. Use \_\_\_\_\_.

4. Write a number sentence to compare 51 and 33. Use \_\_\_\_\_.

Write the numbers in order from least to greatest.

5. 75 62 81 \_\_\_\_\_

6. 20 11 19 6 \_\_\_\_\_

7. 89 91 82 90 \_\_\_\_\_

Add.

8.  $\begin{array}{r} 8 \\ + 2 \\ \hline \end{array}$  9.  $\begin{array}{r} 9 \\ + 4 \\ \hline \end{array}$  10.  $\begin{array}{r} 3 \\ + 4 \\ \hline \end{array}$

11.  $\begin{array}{r} 7 \\ + 9 \\ \hline \end{array}$  12.  $\begin{array}{r} 3 \\ + 8 \\ \hline \end{array}$  13.  $\begin{array}{r} 7 \\ + 7 \\ \hline \end{array}$

14.  $9 + 3$  15.  $6 + 3$  16.  $6 + 0$

Subtract.

17.  $\begin{array}{r} 8 \\ - 2 \\ \hline \end{array}$  18.  $\begin{array}{r} 13 \\ - 6 \\ \hline \end{array}$  19.  $\begin{array}{r} 7 \\ - 0 \\ \hline \end{array}$

1. \_\_\_\_\_

Name: \_\_\_\_\_

**Pretest Chapter 1**  
continued

Subtract.

20.  $\begin{array}{r} 13 \\ - 9 \\ \hline \end{array}$  21.  $\begin{array}{r} 11 \\ - 7 \\ \hline \end{array}$  22.  $\begin{array}{r} 17 \\ - 8 \\ \hline \end{array}$

23.  $16 - 9$  24.  $12 - 6$  25.  $10 - 2$

Write a family of facts using the given numbers.

26. 7 2 9 27. 5 4 9

Add.

28.  $\begin{array}{r} 8 \\ + 2 \\ \hline \end{array}$  29.  $\begin{array}{r} 2 \\ + 3 \\ \hline \end{array}$  30.  $\begin{array}{r} 9 \\ + 3 \\ \hline \end{array}$

Tell whether you *add* or *subtract*. Then solve each problem.

31. There were 5 boys and 7 girls at the party. How many children were at the party? \_\_\_\_\_

32. In the first game, 6 runs were scored. 5 runs were scored in the second game. How many more runs were scored in the first game than in the second game? \_\_\_\_\_

33. A bird laid 6 eggs. Only 4 eggs hatched. How many eggs did not hatch? \_\_\_\_\_

Give each missing addend.

34.  $n + 7 = 12$  35.  $4 + n = 8$

2



# Teaching Chapter 1



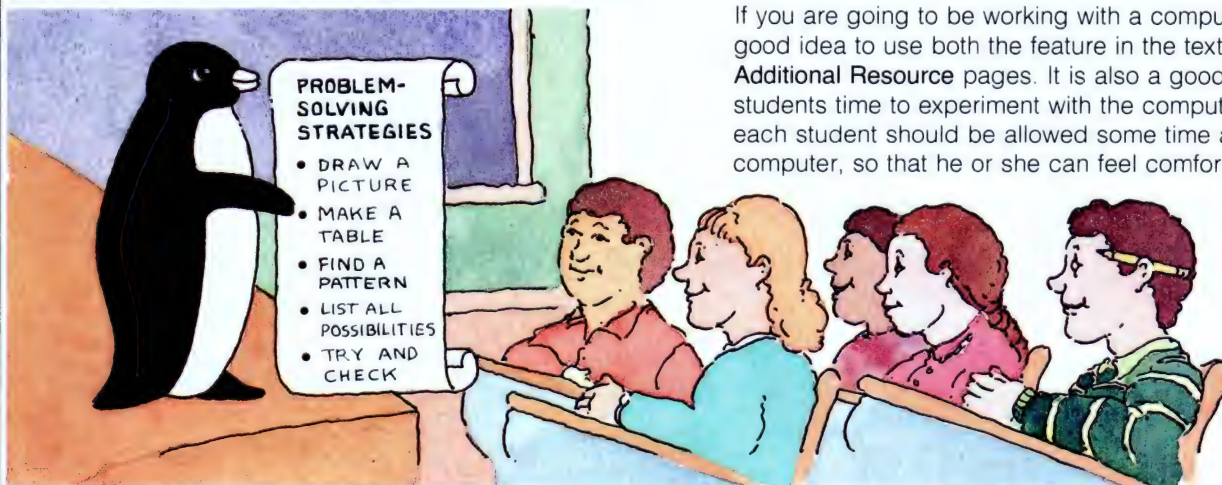
## Problem Solving

**Five-Step Method** In this chapter students are introduced to a five-step method of solving problems (READ, SOLVE, PLAN, ANSWER, LOOK BACK). See page 438 for a discussion of the five steps. On page 16, as in other problem-solving lessons, there is a special focus on one of the five steps. In this case, it's the PLAN step, in which students must choose which operation to use.

**Problem-Solving Strategies** Introduce students to the problem-solving penguin on page 16. The penguin appears throughout the text to encourage students to use problem-solving strategies. In this chapter, students are exposed to several strategies needed to solve problems. While comparing and ordering numbers, they become familiar with number lines. At the end of the chapter, they have the opportunity to solve some nonroutine problems by *drawing a picture* of a line. The *Challenge* on page 21 introduces another problem-solving strategy, *Finding a pattern*. The narrative problems in the *Using Problem-Solving Strategies* features on pages 10–11, 22, 410, and 411, and in later chapters of the text offer more practice with these strategies and a chance to *Use physical models*, *Make a table*, *List all possibilities*, and *Try and check*.

You may find that students will question *Try and check* as a legitimate strategy. Point out to your students that this strategy is not a matter of blindly guessing—but rather of making educated guesses that are then checked against the conditions of the problem. The guess should be repeatedly improved upon until a solution is found.

When students are using *Try and check*, it is a good idea to encourage the students to be systematic about their work—to make a list of possible solutions and the answer in each case. Such a systematic approach can save students time and prevent a frustrating duplication of effort.



This penguin appears throughout the text to encourage students to use strategies.



## Estimation and Mental Math

**Mental Math** It is important that students learn to recall basic facts quickly and correctly. Knowing the basic facts for addition and subtraction provides the foundation on which students can build their ability to solve computational problems.

In **Additional Resource 7**, students use mental math to find sums of 5 or more single-digit numbers by *looking for special numbers*—pairs of numbers whose sum is 10. This is a very useful strategy that can be extended later to larger numbers. Mental math activities of this kind will help students develop number sense and an understanding of concepts.



## Calculators and Computers

**Calculators** In the lesson notes for this chapter, activities are suggested that allow students to practice basic facts, comparing the speed of using a calculator with that of mental arithmetic. They should generalize that for basic facts, mental arithmetic is by far the more efficient type of computation.

**Computers** In this chapter students practice ordering events as a precursor to flowcharting. **Additional Resource 2** begins the work with a computer and introduces the space bar, the cursor, and the PRINT statement.

The computer feature in the student text can be used as a paper-and-pencil activity. The computer pages in the **Additional Resources** are meant for use with a computer and are designed to adapt for use with any computer.

If you are going to be working with a computer, it is a good idea to use both the feature in the text and the **Additional Resource** pages. It is also a good idea to allow students time to experiment with the computer. If possible, each student should be allowed some time alone at the computer, so that he or she can feel comfortable with it.



For a general overview of these topics, see pages 436–485.



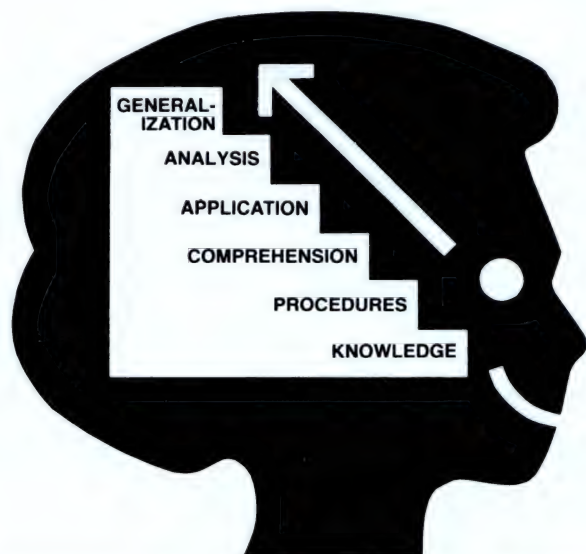
## Concrete Materials

Chapter 1 focuses on number comparison, and addition and subtraction facts. The lesson notes frequently suggest activities, using counters and number lines. In addition to the counters available in the Punchouts and the Math Kit, you can use other small objects such as beans, buttons, and bottle caps, to serve as counters.

Have students use objects or counters to illustrate and help solve the story problems in the lessons. You also may want to display groups of objects, and have students write problems about those objects.

There are three stages that students should go through to develop a sound foundation for mathematical concepts. First, students should work with objects, joining or removing as the situation indicates (concrete stage). When they are able to do this work easily, they can use pictures of objects, verbalizing how the pictured objects are joined or separated (pictorial stage). When students are proficient in the two previous stages, they can find real success in working with numerals (symbolic stage).

While most students may be able to add and subtract easily, it is very important that students having difficulty be encouraged to use concrete materials. You may find it valuable to set up an activity table in a corner of the room. Then, when just a few students need some reinforcement of concepts using concrete materials, you can meet the need quickly.



Emphasizing problem solving will help students improve their higher order thinking skills.



## Teaching Techniques

**Questioning and Responding** To help students learn basic-fact strategies, ask the class for the answer to a basic fact and then follow up by asking how many different ways the students used to get the answer.

As you introduce the lessons and ask questions to check for understanding, avoid too many questions that ask only for factual recall. Ask “why,” “how,” and “what do you think” types of questions so that you can really find out whether the students understand.

**Helping Students Read and Write Mathematics** To help students get familiar with their math books, walk them through some lessons. Point out parts of the lessons such as examples, word problems, new terms, and diagrams. When students first do written assignments, discuss any rules you wish to establish about how they are to show their work—for example, whether they are to circle the answer or whether they are to write answers to word problems using complete sentences.

**Teaching Students with Special Needs** A variety of resources are available to you in *Invitation to Mathematics* when you have to adapt instruction to teach students with special needs: gifted students, high achievers, low achievers, special education students, and students with limited English proficiency. A discussion of these resources and some helpful teaching suggestions are found on pages 458–460 of this Teacher’s Edition and on pages like this one in front of each chapter.



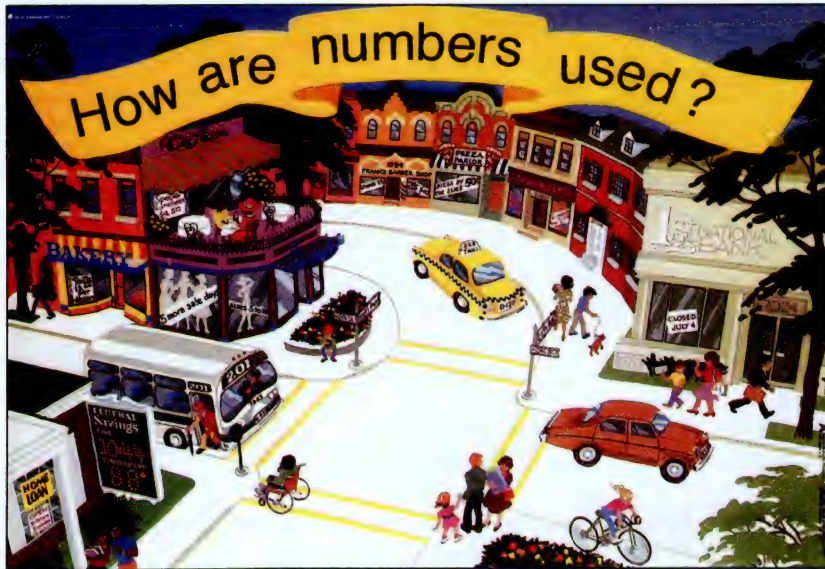
## Thinking Skills

Many thinking skills are reinforced in this chapter. Students **recall factual knowledge** as they practice basic facts. They **follow rules and procedures** for comparing numbers. They work on **comprehending concepts** and **applying concepts** in the Situational Lesson on page 1, in the lesson on pages 3–4 about uses of numbers, and in word problems throughout which require *choosing the operation*. The Thinking Skills exercise on page 15 and the *Using Problem-Solving Strategies* features encourage **analyzing relationships**. On pages 21 and 411, students will *find patterns* to help them **make generalizations**. For an overview of thinking skills, see pages 454–455.

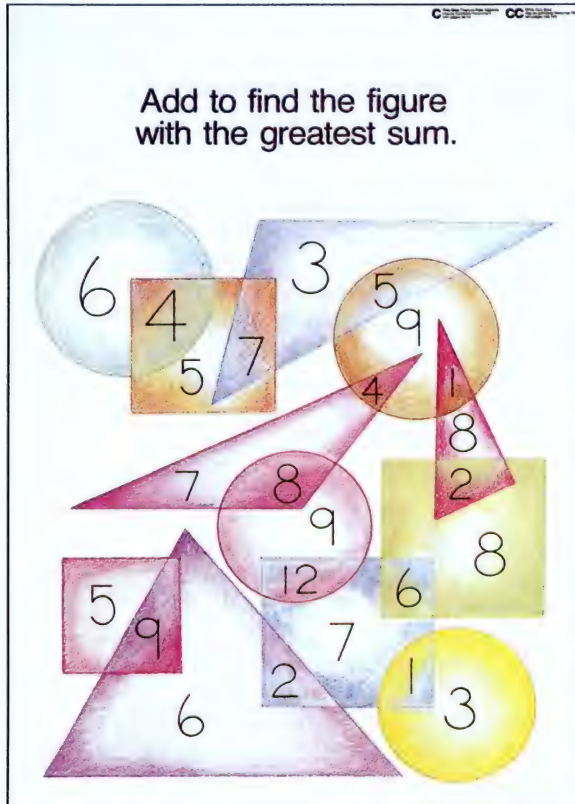


## Bulletin Board Suggestions

The posters shown here can be used with Chapter 1. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster A



Math Poster C



Math Poster B

### Materials Chapter 1

- Counters (Punchouts or Math Kit) 2–15, 18–19
- Magazine 2–3
- Number lines (Teaching Aid A) 4–7\*
- Basic-facts chart (Teaching Aid B) 6–9
- Spinners (Punchouts or Math Kit) 8–9

\*Teaching Aids are available in the *Tests and Management Aids* section of the Teacher's Resource File.



#### Basic Situation

Display Poster A to motivate a discussion about how numbers are used. Discuss with students why numbers are important in their everyday lives. Present to the class the task of designing and preparing a display to show students in other classes how numbers are used and why they are important. You may want to encourage students to work in groups.

#### Possible Problems

- In what situations are numbers used?
- How could the uses of numbers be organized?
- How should the uses be displayed (scrapbook, poster, chart, bulletin board)?
- How would watching a baseball game, shopping for groceries, deciding when to get up in the morning, or other common occurrences be different if numbers were not used?

#### Indicators of Success

Students will probably begin to collect pictures containing numbers from magazines, newspapers, labels from boxes, etc. This may be random at first, but they should see a need to organize their materials when they begin to consider how the materials are going to be displayed.

On pages 2 and 3, students learn four ways that numbers can be used. Students might begin sorting their materials on the basis of these categories. Some might choose to display these categories by making a table like the one shown in *Possible Results*. Other students might draw pictures incorporating the uses they have found or showing what a situation would be like without numbers.

#### Ways to Help

Have students refer to Poster A to give them ideas on how to get started.

Refer students to the lesson on pages 2 and 3. Encourage students to find examples of uses which are similar to those shown on these pages.

As you proceed through the chapter, you may want to point out other examples of uses of numbers. The scales on page 4 (measure), the date on page 6 (label), and the baseball cards on page 8 (count) are some of the examples.



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

#### Possible Results

Students might make a table containing pictures of uses organized under the column headings.

Count	Measure	Order	Label
<p><u>Sales Journal</u></p> <p>o pens    <u>HH</u> 1</p> <p>pencils <u>HH</u> III</p> <p>clips    III</p>			

Other students might draw a picture.



1st Race	
Place	Time
1st J. Smith	1.14
2nd	
3rd	



## Objective 1

Identify uses of numbers.

### Lesson Theme

Recreation: Traveling to a Dog Show

### Vocabulary

Count, label, measure, order

### Materials

- Counters (Punchouts or Math Kit)
- Magazines

### Introduction

Ask "How old are you? What is our room number? What time is it? How many are in your family?" Point out that each question's answer includes a number. Ask for other questions that require a number answer.

**Using Concrete Materials** Have students use counters to show some of the different uses of numbers. Have each of them count 15 counters and place them in a row. Have them point to the fifth counter, the tenth counter, and the first counter. Have them put their pencils next to the counter and complete the sentence, "My pencil is about \_\_\_ counters long."

**Motivational Situation** Pose the following problem to students. Suppose you were asked to organize a dog show for your school. Name some ways you might use numbers in your planning. [How many categories of dogs will be entered? How many tickets will be sold? How many prizes will be awarded?]

### Using the Pages

**Teach** Discuss the examples of number use shown on the page.

#### Reading and Writing Mathematics

Review *count*, *measure*, *order*, and *label*. Have students count chairs in the classroom, measure the height of one chair, order the chairs from the front to the back of the room, and label each student's seat.

**Try Error Analysis** Watch for students who become confused because more than one number use could apply to a number. Point out that a number may have more than one function. For example, an apartment number can label (identify the apartment), or it can order (describe the apartment's location in a building).

**Practice** Accept any answers students can defend to your satisfaction.

**Apply Problem Solving** Ask students to think of and defend more than one use of the numbers. [19th labels the dog show and orders it in a list of dog shows.]

### Using Numbers

On her way to the Numberville Dog Show, Peggy noticed that numbers are used in many ways.

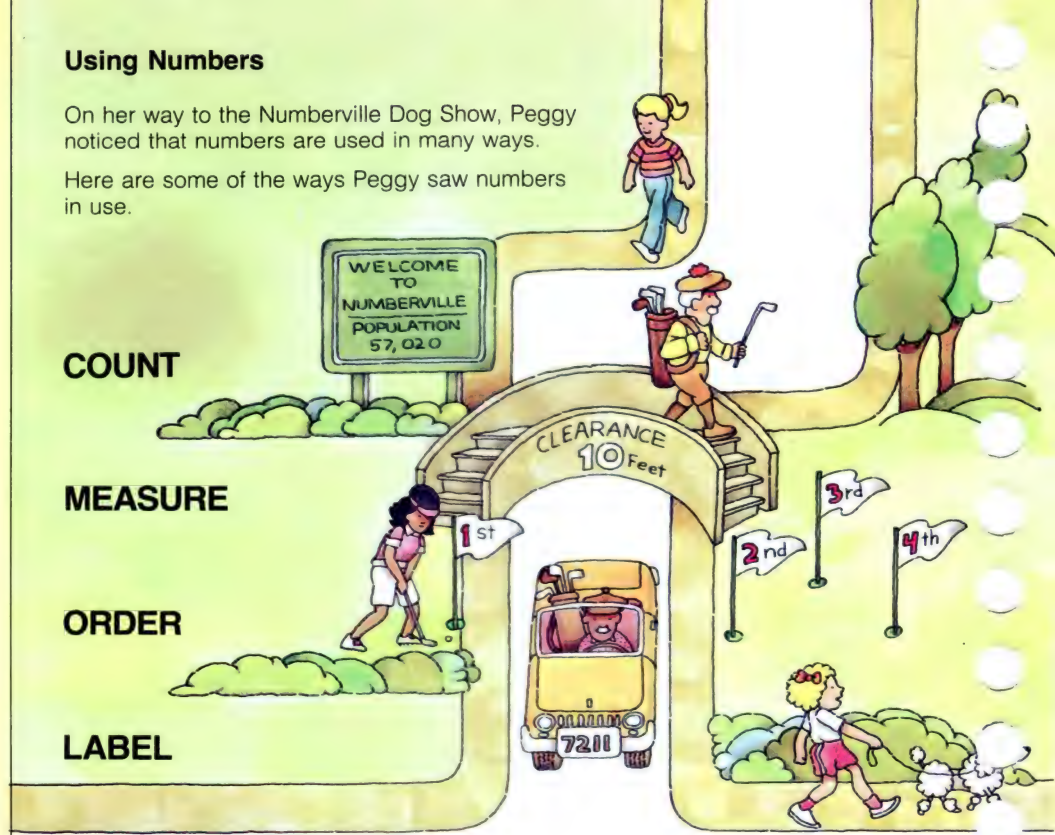
Here are some of the ways Peggy saw numbers in use.

#### COUNT

#### MEASURE

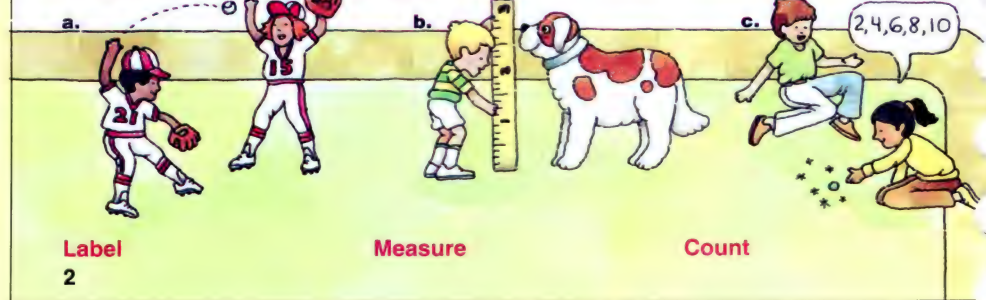
#### ORDER

#### LABEL



**Try Exercises are intended for classroom use. They contain different types of exercises that meet the lesson objectives.**

**Try** For each picture, tell if the number is used to count, to measure, to order, or to label. **Answers will vary. Accept any answer the student can justify. See below for sample answers.**



**Label**  
2

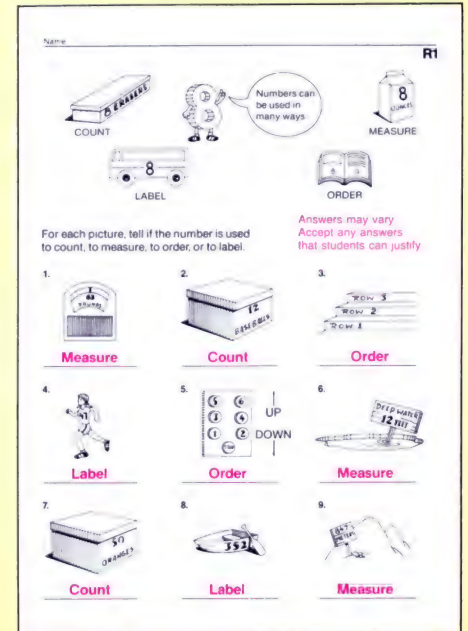
**Measure**

**Count**

### Practice 1



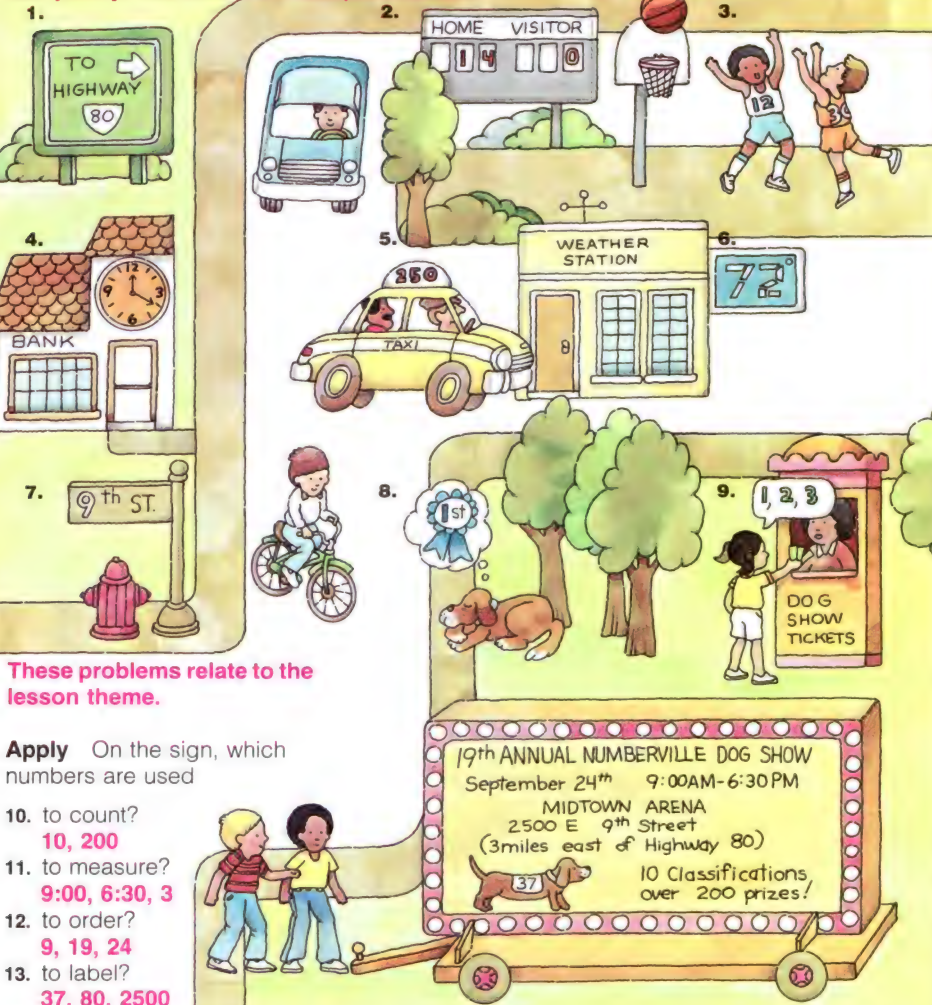
### Reteaching 1





1. Label    2. Count    3. Label    4. Measure    5. Label    6. Measure
7. Order    8. Order    9. Count

**Practice** For each picture, tell if the number is used to count, to measure, to order, or to label. **Answers will vary. Accept any answer the student can justify. See above for sample answers.**



These problems relate to the lesson theme.

**Apply** On the sign, which numbers are used

10. to count?  
10, 200
11. to measure?  
9:00, 6:30, 3
12. to order?  
9, 19, 24
13. to label?  
37, 80, 2500

More Practice exercises are found at the end of the book. These additional exercises reinforce the skill taught in the lesson.

More Practice Set 1, page 352 3

## Assignment Guide

basic	1-13
average	1-13
enriched	1-13

More Practice Set 1,  
page 352

**Homework to do with others** Ask each student to take a short walking trip with another person. As they walk, have both persons observe and record the places and the ways in which numbers are used. Have each student make a simple display showing what he or she found.

## Follow-Up

**Extra Practice** Help students design a bulletin board using the words *count*, *label*, *measure*, and *order* with magazine pictures that contain numbers.

**Enrichment** Have students examine the introductory pages of this book and discuss how numbers are used there. [Copyright date, page numbers, table of contents]

## Enrichment 1

**Flow Charts I** E1

A flow chart describes a step-by-step process. Follow these flow charts to get the result for each exercise. Write the result in the circle.

1. Start with 3 → +7 → ×2 → -4 → **10**
2. Start with 12 → -4 → +7 → +3 → **18**

Some flow charts are more complex. Find the results for these flow charts.

3. Start with 11 → -7 → +6 → Is the number greater than 20? → yes → **22**  
no → back to +6
4. Start with 9 → ×4 → -7 → Is the number less than 10? → yes → **8**  
no → back to ×4
5. Start with 19 → -6 → Is the number less than 5? → yes → ×3 → **3**  
no → back to -6

## Additional Resource 1



### Math Poster A Using Numbers

Some numbers are used to count: for example, 5 sale days in the boutique and 2 yards on sale in the fabric shop. Some numbers are used to measure: 88° for temperature, 2 yards of fabric, and sizes 5-16 in the boutique. See Answer Key for other answers and notes about more than one use for some numbers.

## Daily Maintenance

Write the next four numbers in each pattern.

1. 2, 4, 6, \_\_, \_\_, \_\_, \_\_ [8, 10, 12, 14]
2. 3, 6, 9, \_\_, \_\_, \_\_, \_\_ [12, 15, 18, 21]
3. 5, 10, 15, \_\_, \_\_, \_\_, \_\_ [20, 25, 30, 35]
4. 1, 3, 5, \_\_, \_\_, \_\_, \_\_ [7, 9, 11, 13]
5. 4, 7, 10, \_\_, \_\_, \_\_, \_\_ [13, 16, 19, 22]
6. 10, 20, 30, \_\_, \_\_, \_\_, \_\_ [40, 50, 60, 70]



**Objective 2** (Target Objective)  
Compare and order numbers less than 100 using  $<$  and  $>$ .

**Lesson Theme**  
Recreation: Dog Show

**Materials**

- Counters (Punchouts or Math Kit)
- Number Lines (Teaching Aid A)\*

## Introduction

**Using Concrete Materials** Have each student display 52 and 38 on his or her desk with ten-sticks and unit-squares. Ask which number is greater. Have the students give a reason for believing one number is greater than another. Encourage students to compare the ten-sticks first. Remind them that the number with more tens is always greater. Repeat the activity with other numbers. Focus on the number that is less also.

Use masking tape to make a life-size number line (1–40) on the classroom floor. Give each student a one- or two-digit number card less than 40 and ask them to arrange themselves on the number line. Then have them say number sentences, comparing their number to larger and smaller numbers. For example, "My 7 is greater than Tony's 5 and less than Sarah's 11."

## Using the Pages

**Teach** Read and discuss the examples. This is the first time the symbols  $<$  and  $>$  are used in this text. Explain the symbols and stress that  $30 < 55$  and  $55 > 30$  show the same relationship.

**Try Error Analysis** Watch for students who use the symbols  $<$  and  $>$  incorrectly. Explain that the point of the symbol always points to the smaller number. (See **Reteaching 2**)

**Practice Error Analysis** In Exercises 19–24 watch for students who have difficulty ordering numbers when the tens digits are the same. Remind these students that if the tens digits are the same then they must compare the ones digits to determine which number is greater.

**Apply Problem Solving** Have students draw a large number line from 1 to 100 on the chalkboard and use it for reference as they do Problems 25–30.

**Use data from outside the text** For Problem 31, the heights given will vary from source to source, and may be given as a range.

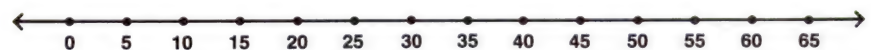
\*Teaching Aids are available in the **Tests and Management Aids** section of the **Teacher's Resource File**.

## Comparing and Ordering Numbers



**A.** Compare the weights of the beagle and the sheepdog.

Compare 30 and 55. Use this number line.



30 is to the left of 55, so  
30 is less than 55.

$$30 < 55$$

The beagle weighs less than the sheepdog.

55 is to the right of 30, so  
55 is greater than 30.

$$55 > 30$$

The sheepdog weighs more than the beagle.

**B.** Give the weights of the three dogs in order from least to greatest.

Find 30, 15, and 55 on the number line above.

In order from least to greatest, the weights are 15, 30, 55.

4

## Practice 2

Name \_\_\_\_\_ P2

Write two number sentences to compare each pair of numbers. Use  $<$  and  $>$ .

- 17 and 21  $17 < 21$   $21 > 17$
- 54 and 45  $45 < 54$   $54 > 45$
- 13 and 8  $8 < 13$   $13 > 8$
- 22 and 19  $19 < 22$   $22 > 19$
- 41 and 40  $40 < 41$   $41 > 40$
- 31 and 0  $0 < 31$   $31 > 0$

Write the numbers in order from least to greatest.

- 56 67 19 19 56 67
- 18 3 6 41 3 6 18 41
- 2 89 54 33 2 33 54 89

Use the table to answer each question.

In which city did Annie Starr's Rodeo give the most shows? Circle the answer.

City	Number of shows
10. New York or Chicago	New York 15 Chicago 22
11. New York or San Diego	St. Louis 17 San Diego 31
12. Chicago or St. Louis	
13. St. Louis or San Diego	
14. Chicago or San Diego	
15. St. Louis or New York	

16. Write the numbers of shows in order from least to greatest.  
15 17 22 31

## Reteaching 2

Name \_\_\_\_\_ R2

A toy poodle weighs 7 pounds. A Dalmatian weighs 50 pounds.

7 is less than 50.  $7 < 50$

50 is greater than 7.  $50 > 7$

A Dalmatian weighs more than a toy poodle.

Write  $<$  or  $>$  in each circle.

- 8  $<$  11
- 3  $<$  7
- 5  $<$  4
- 12  $<$  9
- 14  $<$  16
- 14  $<$  12
- 24  $<$  16
- 24  $<$  36
- 16  $<$  36
- 12  $<$  18
- 45  $<$  54
- 38  $<$  37

Write the numbers 5, 28, 13 in order from the least to the greatest.

5  $<$  13  $<$  28

5 is the least. 28 is the greatest.

Write the numbers in order from the least to the greatest.

13. 17 24 8	<u>8</u>	<u>17</u>	<u>24</u>
14. 6 22 9	<u>6</u>	<u>9</u>	<u>22</u>
15. 37 27 47	<u>27</u>	<u>37</u>	<u>47</u>
16. 55 56 54	<u>54</u>	<u>55</u>	<u>56</u>



## Try

- a. Write two number sentences to compare 5 and 16. Use < and >.

**5 < 16, 16 > 5**

- b. Write the numbers in order from least to greatest.

65 7 42 98  
**7 42 65 98**

**Practice** Write two number sentences to compare each pair of numbers. Use < and >.

- |   |  |  |  |
|---|--|--|--|
| 1. 5 and 25<br><b>5 &lt; 25, 25 &gt; 5</b>    | 2. 60 and 45<br><b>45 &lt; 60, 60 &gt; 45</b>  | 3. 35 and 17<br><b>17 &lt; 35, 35 &gt; 17</b>  | 4. 54 and 65<br><b>54 &lt; 65, 65 &gt; 54</b>  |
| 5. 63 and 82<br><b>63 &lt; 82, 82 &gt; 63</b> | 6. 29 and 33<br><b>29 &lt; 33, 33 &gt; 29</b>  | 7. 71 and 7<br><b>7 &lt; 71, 71 &gt; 7</b>     | 8. 98 and 2<br><b>2 &lt; 98, 98 &gt; 2</b>     |
| 9. 68 and 55<br><b>55 &lt; 68, 68 &gt; 55</b> | 10. 47 and 94<br><b>47 &lt; 94, 94 &gt; 47</b> | 11. 13 and 17<br><b>13 &lt; 17, 17 &gt; 13</b> | 12. 36 and 31<br><b>31 &lt; 36, 36 &gt; 31</b> |

Write the numbers in order from least to greatest.

- |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|
| 13. 15 8 14<br><b>8 14 15</b>         | 14. 12 9 6<br><b>6 9 12</b>           | 15. 98 81 73<br><b>73 81 98</b>       |
| 16. 28 13 30<br><b>13 28 30</b>       | 17. 50 41 33<br><b>33 41 50</b>       | 18. 20 16 49<br><b>16 20 49</b>       |
| 19. 83 52 63 55<br><b>52 55 63 83</b> | 20. 60 35 47 68<br><b>35 47 60 68</b> | 21. 15 47 17 43<br><b>15 17 43 47</b> |
| 22. 74 60 59 77<br><b>59 60 74 77</b> | 23. 51 58 41 54<br><b>41 51 54 58</b> | 24. 89 96 84 86<br><b>84 86 89 96</b> |

**Apply** Use data from a table. Solve each problem.

Which dog weighs more?

25. Springer spaniel or boxer  
**Boxer**
26. Doberman pinscher or collie  
**Doberman pinscher**
27. Labrador retriever or collie  
**Labrador retriever**
28. Poodle or Doberman pinscher  
**Doberman pinscher**
29. Boxer or collie  
**Boxer**

Dog	Weight (pounds)
Springer spaniel	43
Boxer	85
Doberman pinscher	93
Collie	57
Labrador retriever	97
Poodle	21

**A star indicates an exercise of above-average difficulty.**

30. Give the weights of the six dogs in order from least to greatest.  
**21 43 57 85 93 97**
31. Find the facts. Which dog is taller, a springer spaniel or a boxer?  
**Boxer**

More Practice Set 2, page 352 5

## Assignment Guide

basic 1–28 even  
average 1–30 odd, 31  
enriched 1–12 even, 13–31

**More Practice Set 2,**  
**page 352**

## Follow-Up

**Extra Practice** Prepare number cards from 0 to 99. Give two cards to each student and have them say aloud two number sentences about their cards; for example, "Five is greater than one. One is less than five." Repeat, using different cards.

## Reteaching Using Concrete Materials

Use the same kind of number line that you made for the *Introduction*. Have students place groups of objects—such as five pencils, six pencils, and three pencils—on the proper place on the number line. Have them say number sentences to compare and order the objects.

**Enrichment** Have students find examples of number lines in everyday life [Scales, rulers, clock faces] and explain how these examples can be used to compare numbers.

## Reading and Writing Mathematics

Read these sentences to students and have them write the sentences using only numerals and symbols. Fifty-nine is greater than forty-three. [59 > 43] Eight plus seven equals fifteen. [8 + 7 = 15] Twelve minus nine equals three. [12 – 9 = 3]

## Computer Assisted Instruction

Mathematics Courseware Series

- Numeration 1, Activities 2, 5
- Numeration 2, Activity 2a
- Mathematics Action Games
- Frog Jump, Hard Level

## Daily Maintenance

Find the missing numbers.

- 11, \_\_, 13, 14, \_\_, 16 [12, 15]
- 23, 24, \_\_, \_\_, 27, 28 [25, 26]
- 41, \_\_, \_\_, 38, 37, \_\_ [40, 39, 36]
- 17, \_\_, 19, \_\_, 21, 22 [18, 20]
- 63, 62, 61, \_\_, \_\_, \_\_, 57 [60, 59, 58]
- 76, \_\_, \_\_, 79, \_\_, 81 [77, 78, 80]

## Enrichment 2

Name \_\_\_\_\_ E2

**Magic Squares**

In a magic square the sum of the numbers in each row, column, and diagonal is the same. The magic sum for this magic square is 27.

In the following exercises, choose the greater number. Write your answers in the numbered boxes. If you are correct, your answers will form magic squares. Find the magic sum for each magic square.

1. 19, 28	2. 24, 9
3. 48, 56	4. 37, 64
5. 36, 28	6. 8, 5
7. 11, 16	8. 48, 39
9. 26, 44	
10. Magic sum = <b>108</b>	

7	6	14
16	9	2
4	12	11

1.	2.	3.
	24	56
64	36	8
16	48	44

11.	12.	13.
83	35	71
51	63	75
55	91	43

11. 83, 67      12. 29, 35  
13. 64, 71      14. 51, 46  
15. 63, 22      16. 75, 58  
17. 49, 55      18. 86, 91  
19. 43, 27  
20. Magic sum = **189**

## Additional Resource 2

Name \_\_\_\_\_ Additional Resource 2

**Computer The Keyboard**

A microcomputer receives your instructions, follows your instructions, and shows you the results.

These three steps—input, processing, and output—happen with any computer.

The instructions that you give the computer are called **input**. The computer performs your instructions in an area called the **processor**. The results that the computer shows you are called the **output**.

You give your input to the computer by typing instructions on the keyboard. The line or box on the screen is called the **cursor**. It tells you that it is your turn to type.

Find the space bar and learn how to move the cursor backward. The space bar and cursor will help you correct typing errors.

To communicate with the computer, you must use a special language that it understands. One computer language is called **BASIC**.

Turn on your computer. Find the **RETURN** or **ENTER** key. Press it after typing each of these instructions. Write your output.

1. PRINT 22 <b>22</b>	2. PRINT 77 6 <b>77 6</b>
3. PRINT 10 + 17 <b>27</b>	4. PRINT 45 - 37 <b>8</b>

Answers will vary. Sample answer is given.

5. Type this line: Press **RETURN** or **ENTER**. The computer will not understand your instruction. Write the output.  
**PLAY A GAME SYNTAX ERROR**



## Objective 3 (Target Objective)

Write sums for addition facts.

### Lesson Theme

Recreation: Major League Baseball

### Vocabulary

Addend, sum

### Materials

- Counters (Punchouts, Math Kit)
- Number Lines (Teaching Aid A)

## Introduction

**Using Concrete Materials** Have students group concrete objects, such as counters, pencils, paper clips, or crayons, to represent two addends, and have them count to find the sum of the two groups.

Define *addend* and *sum*. Show how the sum of a problem can be the answer for different questions, as follows:

- John has 3 apples and 4 oranges. How many pieces of fruit does he have in all? [7 pieces]
- The tree was 3 feet tall. It grew 4 more feet. How tall is it now? [7 feet tall]
- Jane has 3 apples. She has 4 more oranges than apples. How many oranges does she have? [7 oranges]

## Using the Pages

**Teach** In Example A guide the class to realize that the order of the addends does *not* affect the sum. In Example B, focus students' attention on the three basic-fact strategies that are suggested.

**Try** To give meaning to the *counting on* strategies, students could use a number line (See *Introduction*, page 4.) to do these exercises. For Exercise a, for example, they could stand on the 5 and take 7 steps to reach 12.

**Practice Error Analysis** Watch for students who have not memorized the basic addition facts. Discuss with these students which of the basic-fact strategies could be used to help recall each troublesome fact.

### Apply Problem Solving

**Write a problem** Ask students to write a problem using data about their favorite sport.

**Error Analysis** Watch for students who have difficulty with Problem 41. Ask these students to describe the action going on in the problem.

**Calculator** Explain to students that a calculator is often used to check an estimate and an estimate is often used as a way to check a calculator answer.

## Addition Basic Facts

- A. On May 23, 1977, the Milwaukee Brewers hit 6 home runs in one game. The Boston Red Sox hit 5 home runs in the same game. How many home runs were hit in that game?

Find  $6 + 5$ .

$$\begin{array}{r} 6 \\ + 5 \\ \hline 11 \end{array} \quad \begin{array}{c} \leftarrow \text{Addend} \rightarrow \\ \leftarrow \text{Addend} \rightarrow \\ \leftarrow \text{Sum} \rightarrow \end{array} \quad \begin{array}{r} 5 \\ + 6 \\ \hline 11 \end{array}$$

11 home runs were hit in that game.

- B. These strategies can help you remember addition facts.



Count on from the greater number.  $6 + 3 = 9$

Use doubles.  $7 + 7 = 14$  So,  $8 + 7 = 15$   $5 + 1 + 6 = 6 + 6 = 12$   $8 + 7 = 15$   $5 + 7 = 12$

Use 10 to Add 8 or 9.  $10 + 4 = 14$   $10 + 2 = 12$   $9 + 5 = 14$   $8 + 4 = 12$

**Discuss** Does the order in which you add two numbers change the sum? **No**

What is the sum when you add 0 and another number?

**The sum is the number you added to 0.**



## Practice 3

Practice 3

Add

1. $\begin{array}{r} 8 \\ + 3 \\ \hline 11 \end{array}$	2. $\begin{array}{r} 2 \\ + 2 \\ \hline 4 \end{array}$	3. $\begin{array}{r} 9 \\ + 8 \\ \hline 17 \end{array}$	4. $\begin{array}{r} 6 \\ + 6 \\ \hline 12 \end{array}$	5. $\begin{array}{r} 8 \\ + 6 \\ \hline 14 \end{array}$
6. $\begin{array}{r} 0 \\ + 9 \\ \hline 9 \end{array}$	7. $\begin{array}{r} 2 \\ + 7 \\ \hline 9 \end{array}$	8. $\begin{array}{r} 5 \\ + 0 \\ \hline 5 \end{array}$	9. $\begin{array}{r} 4 \\ + 9 \\ \hline 13 \end{array}$	10. $\begin{array}{r} 9 \\ + 9 \\ \hline 18 \end{array}$
11. $\begin{array}{r} 1 \\ + 8 \\ \hline 9 \end{array}$	12. $\begin{array}{r} 4 \\ + 3 \\ \hline 7 \end{array}$	13. $\begin{array}{r} 6 \\ + 5 \\ \hline 11 \end{array}$	14. $\begin{array}{r} 1 \\ + 9 \\ \hline 10 \end{array}$	15. $\begin{array}{r} 8 \\ + 7 \\ \hline 15 \end{array}$
16. $5 + 8 = 13$	17. $4 + 6 = 10$	18. $8 + 8 = 16$		
19. $2 + 8 = 10$	20. $9 + 6 = 15$	21. $0 + 4 = 4$		
22. $4 + 7 = 11$	23. $3 + 6 = 9$	24. $7 + 7 = 14$		
25. $1 + 4 = 5$	26. $9 + 5 = 14$	27. $3 + 9 = 12$		
28. $8 + 4 = 12$	29. $7 + 6 = 13$	30. $3 + 7 = 10$		

Solve each problem.

31. In a baseball game, the Stars scored 7 runs and the Jets scored 9 runs. How many runs were scored in all?  
16 runs

32. Marna hit 4 triples during June and 9 triples during July. How many triples did Marna hit in all?  
13 triples

## Reteaching 3

Reteaching 3

Add

6 + 3 = 9

When I'm here you have nothing to add.

7 + 0 = 7

Whoops!

What can you use to clean me?

Add. Write the letters of your answers in the blanks below. One answer is not used.

1. $\begin{array}{r} 9 \\ + 4 \\ \hline 13 \end{array}$ T	2. $\begin{array}{r} 1 \\ + 1 \\ \hline 2 \end{array}$ T	3. $\begin{array}{r} 3 \\ + 2 \\ \hline 5 \end{array}$ S	4. $\begin{array}{r} 6 \\ + 9 \\ \hline 15 \end{array}$ A
5. $\begin{array}{r} 0 \\ + 3 \\ \hline 3 \end{array}$ A	6. $\begin{array}{r} 1 \\ + 9 \\ \hline 10 \end{array}$ P	7. $\begin{array}{r} 3 \\ + 5 \\ \hline 8 \end{array}$ H	8. $\begin{array}{r} 4 \\ + 2 \\ \hline 6 \end{array}$ T
9. $\begin{array}{r} 9 \\ + 9 \\ \hline 18 \end{array}$ O	10. $\begin{array}{r} 2 \\ + 2 \\ \hline 4 \end{array}$ A	11. $\begin{array}{r} 4 \\ + 3 \\ \hline 7 \end{array}$ U	12. $\begin{array}{r} 5 \\ + 9 \\ \hline 14 \end{array}$ E
13. $\begin{array}{r} 9 \\ + 5 \\ \hline 14 \end{array}$ B	14. $\begin{array}{r} 7 \\ + 5 \\ \hline 12 \end{array}$ J	15. $\begin{array}{r} 8 \\ + 8 \\ \hline 16 \end{array}$ O	16. $\begin{array}{r} 1 \\ + 0 \\ \hline 1 \end{array}$ T

A T U B A  
15 6 7 11 3  
T O O T H P A S E  
1 16 18 9 8 10 4 5 13 14



## Try Add.

a.  $\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$  b.  $\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$  c.  $\begin{array}{r} 0 \\ +5 \\ \hline 5 \end{array}$  d.  $\begin{array}{r} 8 \\ +1 \\ \hline 9 \end{array}$  e.  $9 + 8 = 17$  f.  $7 + 6 = 13$  g.  $4 + 8 = 12$

## Practice Add.

1.  $\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$  2.  $\begin{array}{r} 8 \\ +0 \\ \hline 8 \end{array}$  3.  $\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$  4.  $\begin{array}{r} 1 \\ +9 \\ \hline 10 \end{array}$  5.  $\begin{array}{r} 4 \\ +2 \\ \hline 6 \end{array}$  6.  $\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$  7.  $\begin{array}{r} 6 \\ +4 \\ \hline 10 \end{array}$

8.  $\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$  9.  $\begin{array}{r} 1 \\ +6 \\ \hline 7 \end{array}$  10.  $\begin{array}{r} 0 \\ +7 \\ \hline 7 \end{array}$  11.  $\begin{array}{r} 2 \\ +8 \\ \hline 10 \end{array}$  12.  $\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$  13.  $\begin{array}{r} 9 \\ +5 \\ \hline 14 \end{array}$  14.  $\begin{array}{r} 3 \\ +7 \\ \hline 10 \end{array}$

15.  $\begin{array}{r} 6 \\ +0 \\ \hline 6 \end{array}$  16.  $\begin{array}{r} 7 \\ +8 \\ \hline 15 \end{array}$  17.  $\begin{array}{r} 2 \\ +5 \\ \hline 7 \end{array}$  18.  $\begin{array}{r} 6 \\ +3 \\ \hline 9 \end{array}$  19.  $\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$  20.  $\begin{array}{r} 0 \\ +1 \\ \hline 1 \end{array}$  21.  $\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$

22.  $7 + 1 = 8$  23.  $3 + 3 = 6$  24.  $9 + 4 = 13$  25.  $3 + 8 = 11$  26.  $6 + 6 = 12$  27.  $9 + 6 = 15$

28.  $8 + 8 = 16$  29.  $3 + 2 = 5$  30.  $6 + 2 = 8$  31.  $4 + 9 = 13$  32.  $5 + 8 = 13$  33.  $9 + 3 = 12$

34.  $8 + 9 = 17$  35.  $7 + 4 = 11$  36.  $8 + 7 = 15$  37.  $7 + 9 = 16$  38.  $6 + 7 = 13$  39.  $5 + 9 = 14$

The Apply section often includes types of word problems found in previous lessons.

**Apply** Solve each problem.

40. In one All-Star Game, the American League scored 9 runs. The National League scored 7 runs. How many runs were scored in all?  
**16 runs**
41. The New York Giants won 5 World Series. They lost 4 more World Series than they won. How many World Series did they lose?  
**9 World Series**
42. David Lopes had 77 stolen bases in 1975. He had 63 stolen bases in 1976. In which of these years did he have fewer stolen bases?  
**1976**

43. **Calculator** Estimate the total number of runs scored by all 26 major league teams last Saturday. Use a newspaper and a calculator to check your estimate.

**Answers will vary.**

More Practice Set 3, page 353 7

## Assignment Guide

basic 1-40  
average 1-41, 43  
enriched 1-43

More Practice Set 3,  
page 353

## Follow-Up

**Extra Practice** Have students fill out a basic-facts chart for the addition facts. Demonstrate how to do one sample row as shown below. Encourage students to memorize the facts on the chart. After students have completed the chart, have them discuss the different patterns they can find in the chart.

+	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2									
3									
4									
5									
6									
7									
8									
9									

**Calculator** Divide the class into 2 groups. Have one group of students do exercises 22-39 using a calculator and the other group do the exercises mentally. Point out that these exercises can be done faster and more accurately without using a calculator.

## Computer Assisted Instruction

Mathematics Courseware Series

- Addition and Subtraction 1, Activities 3, 4, 8
- Addition and Subtraction 2, Activities 3, 4

## Enrichment 3

Name \_\_\_\_\_ E3

**Telephone Addition**

Use the telephone dial to find the sum of the letters.

L L A M A  
 $5 + 5 + 2 + 6 + 2 = 20$

1. P I G  
 $7 + 4 + 4 = 15$

2. D O G  
 $3 + 6 + 4 = 13$

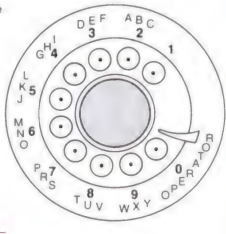
3. B E A R  
 $2 + 3 + 2 + 7 = 14$

Circle the word whose letters have the greater sum.

4. PIG or DOG 5. HORSE or SHEEP  
6. ROBIN or GOOSE 7. DONKEY or TURTLE  
8. MONKEY or SALMON 9. TIGER or WHALE

Circle the name whose letters have the greater sum.

10. BILL JONES or AL SMITH 11. CHARLIE CHAN or SAM SPADE  
12. JANE AUSTEN or GEORGE SAND 13. JONI ROBB or KATY RIVERA  
14. Find the sum of the letters in your name. **Answers will vary.**



## Additional Resource 3

Name \_\_\_\_\_ Additional Resource 3

**Maintenance**

Write the numbers in order from least to greatest.

1. 7, 12, 15 **7 12 15**  
2. 19, 17, 23 **17 19 23**  
3. 19, 30, 23, 15 **15 19 23 30**  
4. 53, 18, 30, 49 **18 30 49 53**  
5. 50, 85, 49, 91 **49 50 85 91**  
6. 78, 99, 83, 12 **12 78 83 99**

Compare the numbers. Use < or >.

7. 21 < 24 8. 78 < 50 9. 43 < 34  
10. 85 < 90 11. 64 < 71 12. 77 < 81  
13. 99 < 81 14. 29 < 30 15. 54 < 45

Circle the name of the animal that is faster. Use the table.

Speeds on Land	
Animal	Miles per hour
Antelope	60
Cheetah	70
Jackrabbit	45
Ostrich	30

16. Cheetah Antelope  
17. Ostrich Jackrabbit

## Daily Maintenance

Compare the numbers. Use < or >.

1. 17 > 19 [  
2. 21 > 18 [  
3. 60 > 29 [  
4. 36 > 47 [  
5. 67 > 58 [  
6. 58 > 51 [  
7. 37 > 40 [  
8. 24 > 22 [  
9. 43 > 34 [  
10. 85 > 90 [  
11. 64 > 71 [  
12. 77 > 81 [  
13. 99 > 81 [  
14. 29 > 30 [  
15. 54 > 45 [  
16. Cheetah > Antelope  
17. Ostrich > Jackrabbit



**Objective 4** (Target Objective)  
Write differences for subtraction facts.

### Lesson Theme

Recreation: Baseball Cards

### Vocabulary

Difference

### Materials

- Counters (Punchouts or Math Kit)
- Spinners (Punchouts or Math Kit)
- Basic-Facts Chart (Teaching Aid B)

### Introduction

**Using Concrete Materials** Give various students 5 objects, 3 objects, and 2 objects. Have the student with 5 objects give 1 to another student. Ask how many are left. [4] Write  $5 - 1 = 4$  on the board. Guide students to see that one use of subtraction is to find how many are left. Have the students with 3 objects and 2 objects compare their groups. Ask: "How many more does 'Jane' have?" [1] Write  $3 - 2 = 1$  on the board. Stress that another use of subtraction is to compare numbers.

### Using the Pages

#### Teach **Reading and Writing Mathematics**

Read and discuss Example A emphasizing the term *difference*.

Encourage students to use the basic-facts strategies described in Example B to help them recall subtraction basic facts.

**Try Error Analysis** Let those students having difficulty use counters. Students could also use a number line to give meaning to the *counting back* strategy. For Exercise a, they could stand on 5 and count the steps they take to the left to reach 3. Stress that students move to the left on a number line to count back.

**Practice** Have students do several exercises on the chalkboard, both vertically and horizontally.

**Apply Problem Solving** Problem 41 is an example of the "taking away" meaning of subtraction. Problem 43 is an example of the "comparing" meaning of subtraction.

**Additional problem** Have students solve the following problem. Randy has 8 cards. Jane has 9 cards. How many more cards does Jane have? [1]

**Calculator** Some calculators have an automatic constant feature. Depending on how the feature works, students' calculators will display either 28 or 35 as an answer for Problem 45.  
(Continued on page 9.)

### Subtraction Basic Facts

- A.** Randy had 17 baseball cards. He gave 9 cards to Jane. How many cards did he have left?

Find  $17 - 9$ .

$$\begin{array}{r} 17 \\ - 9 \\ \hline 8 \text{ Difference} \end{array}$$

Randy had 8 cards left.

**Discuss** What is the difference when you subtract a number from itself? **0** when you subtract zero from another number?

**The number**



- B.** These strategies can help you remember facts.

Count back from the greater number.

$$\begin{array}{r} 8 - 2 = 6 \end{array}$$



Count up from the lesser number.

$$\begin{array}{r} 7 - 5 = 2 \end{array}$$

**Mental Math**

Use 10 to subtract 9.

$$\begin{array}{r} 17 - 10 = 7 \\ 16 - 9 = 7 \end{array}$$

**Try** Subtract.

$$\begin{array}{r} 5 \\ - 2 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 11 \\ - 4 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 7 \\ - 3 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 15 \\ - 8 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 6 \\ - 0 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 7 \\ - 7 \\ \hline 0 \end{array}$$

8

### Practice 4

Name: \_\_\_\_\_

What kind of jewel is found at any baseball game?

To find out, work each exercise. If the answer to an exercise is in the oval, draw a circle around the exercise and its letter. Write the circled letters in order on the blanks at the bottom.

**P4**

1.  $\begin{array}{r} 9 \\ 18 \\ 9 \end{array}$  2.  $\begin{array}{r} 5 \\ 14 \\ 7 \end{array}$  3.  $\begin{array}{r} 7 \\ 13 \\ 6 \end{array}$  4.  $\begin{array}{r} 1 \\ 9 \\ 6 \end{array}$  5.  $\begin{array}{r} 6 \\ 12 \\ 6 \end{array}$  6.  $\begin{array}{r} 8 \\ 16 \\ 7 \end{array}$  7.  $\begin{array}{r} 4 \\ 12 \\ 7 \end{array}$  8.  $\begin{array}{r} 9 \\ 16 \\ 7 \end{array}$  9.  $\begin{array}{r} 5 \\ 13 \\ 3 \end{array}$  10.  $\begin{array}{r} 7 \\ 14 \\ 5 \end{array}$  11.  $\begin{array}{r} 3 \\ 12 \\ 6 \end{array}$  12.  $\begin{array}{r} 4 \\ 8 \\ 3 \end{array}$

**D I A M O N D**

### Reteaching 4

Name: \_\_\_\_\_

Subtract.

**R4**

1.  $\begin{array}{r} 7 \\ - 3 \\ \hline 4 \end{array}$  2.  $\begin{array}{r} 11 \\ - 4 \\ \hline 7 \end{array}$  3.  $\begin{array}{r} 12 \\ - 8 \\ \hline 4 \end{array}$  4.  $\begin{array}{r} 7 \\ - 0 \\ \hline 7 \end{array}$  5.  $\begin{array}{r} 14 \\ - 6 \\ \hline 8 \end{array}$  6.  $\begin{array}{r} 9 \\ - 5 \\ \hline 4 \end{array}$  7.  $\begin{array}{r} 14 \\ - 5 \\ \hline 9 \end{array}$  8.  $\begin{array}{r} 15 \\ - 6 \\ \hline 9 \end{array}$  9.  $\begin{array}{r} 3 \\ - 3 \\ \hline 0 \end{array}$  10.  $\begin{array}{r} 12 \\ - 7 \\ \hline 5 \end{array}$  11.  $\begin{array}{r} 5 \\ - 3 \\ \hline 2 \end{array}$  12.  $\begin{array}{r} 10 \\ - 6 \\ \hline 4 \end{array}$  13.  $\begin{array}{r} 10 \\ - 2 \\ \hline 8 \end{array}$  14.  $\begin{array}{r} 9 \\ - 0 \\ \hline 9 \end{array}$  15.  $\begin{array}{r} 6 \\ - 2 \\ \hline 4 \end{array}$  16.  $\begin{array}{r} 7 \\ - 4 \\ \hline 3 \end{array}$  17.  $\begin{array}{r} 5 \\ - 0 \\ \hline 5 \end{array}$  18.  $\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$  19.  $\begin{array}{r} 5 \\ - 0 \\ \hline 5 \end{array}$  20.  $\begin{array}{r} 15 \\ - 9 \\ \hline 6 \end{array}$  21.  $\begin{array}{r} 6 \\ - 4 \\ \hline 2 \end{array}$  22.  $\begin{array}{r} 7 \\ - 5 \\ \hline 2 \end{array}$  23.  $\begin{array}{r} 4 \\ - 2 \\ \hline 2 \end{array}$  24.  $\begin{array}{r} 2 \\ - 0 \\ \hline 2 \end{array}$  25.  $\begin{array}{r} 13 \\ - 4 \\ \hline 9 \end{array}$  26.  $5 - 2 = 3$  27.  $6 - 3 = 3$  28.  $10 - 7 = 3$  29.  $6 - 5 = 1$  30.  $5 - 4 = 1$  31.  $16 - 9 = 7$  32.  $4 - 4 = 0$  33.  $7 - 2 = 5$  34.  $12 - 6 = 6$



## Practice Subtract.

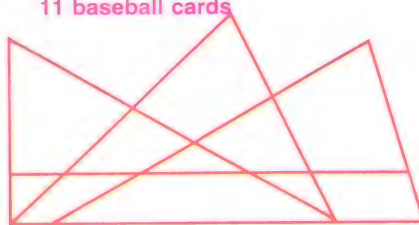
1.  $\begin{array}{r} 5 \\ -4 \\ \hline 1 \end{array}$
2.  $\begin{array}{r} 7 \\ -1 \\ \hline 6 \end{array}$
3.  $\begin{array}{r} 13 \\ -8 \\ \hline 5 \end{array}$
4.  $\begin{array}{r} 11 \\ -9 \\ \hline 2 \end{array}$
5.  $\begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array}$
6.  $\begin{array}{r} 8 \\ -3 \\ \hline 5 \end{array}$
7.  $\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$
8.  $\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$
9.  $\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$
10.  $\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$
11.  $\begin{array}{r} 10 \\ -3 \\ \hline 7 \end{array}$
12.  $\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$
13.  $\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$
14.  $\begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$
15.  $\begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$
16.  $\begin{array}{r} 11 \\ -2 \\ \hline 9 \end{array}$
17.  $\begin{array}{r} 3 \\ -0 \\ \hline 3 \end{array}$
18.  $\begin{array}{r} 9 \\ -0 \\ \hline 9 \end{array}$
19.  $\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$
20.  $\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$
21.  $\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$
22.  $13 - 4 = 9$
23.  $14 - 9 = 5$
24.  $10 - 8 = 2$
25.  $9 - 4 = 5$
26.  $12 - 9 = 3$
27.  $14 - 7 = 7$
28.  $12 - 6 = 6$
29.  $13 - 6 = 7$
30.  $11 - 3 = 8$
31.  $17 - 8 = 9$
32.  $10 - 2 = 8$
33.  $13 - 9 = 4$
34.  $15 - 9 = 6$
35.  $13 - 7 = 6$
36.  $11 - 6 = 5$
37.  $15 - 7 = 8$
38.  $14 - 8 = 6$
39.  $16 - 9 = 7$

40. Look at Exercises 1–39 on page 7. Look at Exercises 1–39 that you just completed. Explain why you would or would not use a calculator to find the sums or differences.

**Answers may vary. In general, mental math should be used when possible.**

## Apply Solve each problem.

41. Kenji had 16 baseball cards. He gave 7 of them away. How many baseball cards did he have left?  
**9 baseball cards**
43. Bert has 15 cards to trade. Marta has 9 cards to trade. How many more cards does Bert have to trade than Marta?  
**6 more cards**
45. **Calculator** Press: 7  $+$   $=$   $=$   $=$   $=$  . What happened on your calculator?  
**Nothing, or did repeated addition with 7**
46. **Calculator** Press: 2  $M+$  3  $M+$   $MR$  What is the display?  
**5**
47. Work with another student to find how many triangles are in this figure.  
**17 triangles**
42. Don has 49 baseball cards. Nina has 97 cards. Who has the greater number of cards?  
**Nina**
44. Jim put 6 baseball cards on page 8 of his scrapbook and 5 cards on page 9. How many baseball cards did he put on pages 8 and 9 of his scrapbook?  
**11 baseball cards**



More Practice Set 4, page 353 9

## Assignment Guide

basic	1–40 even, 41, 43, 45–47
average	1–39 odd, 40–47
enriched	1–21, 40–47

**More Practice Set 4, page 353**

(Continued from page 8.)

**Draw a picture** For Problem 47, suggest that students trace the given diagram. Then they can number triangles or shade them with crayon or colored pencils as they count each one.

## Follow-Up

**Extra Practice** Make two spinners—one numbered 10–18 and one numbered 0–9. Have students spin each spinner and subtract the smaller number from the larger one.

You also may wish to adapt the game on pages 140–141 to use for writing differences for subtraction facts.

**Reteaching** Have students write on cards basic subtraction facts they have not yet mastered. Each card should have the number phrase on the front and the answer on the back of the card. Students can use these cards to test each other on the facts. As students master a fact, that fact card can be removed from the file.

## Computer Assisted Instruction

Mathematics Courseware Series

- Addition and Subtraction 1, Activities 5, 6, 9
- Addition and Subtraction 2, Activities 7, 8
- Mathematics Action Games
- Picture Parts, Hard Level

## Cooperative Learning Groups

See page 474 of this Teacher's Edition.

## Enrichment 4

Name: \_\_\_\_\_ E4

**Computer Subtraction**

These computers are programmed to start with the input and follow the flow chart. Some of the computers are broken and give wrong answers. Circle the broken computers.

Input  $\rightarrow$   $-8$   $\rightarrow$   $-5$   $\rightarrow$  Output

- Input 17, Output 4
- Input 15, Output 12
- Input 16, Output 3
- Input 14, Output 1
- Input 12, Output 1
- Input 10, Output 3

This flow chart tells what the next group of computers is programmed to do. Circle the broken ones.

Input  $\rightarrow$   $-7$   $\rightarrow$   $+5$   $\rightarrow$   $-8$   $\rightarrow$  Output

- Input 13, Output 3
- Input 11, Output 1
- Input 19, Output 1

## Additional Resource 4



## Math Poster B Applying Addition and Subtraction

There are 3 more quartz samples than malachite samples on the poster. See Answer Key for other sample problems.

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- |                 |                 |
|-----------------|-----------------|
| 1. $9 + 6$ [15] | 2. $5 + 3$ [8]  |
| 3. $7 + 4$ [11] | 4. $8 + 1$ [9]  |
| 5. $6 + 4$ [10] | 6. $5 + 7$ [12] |



## Using Problem-Solving Strategies

- Use physical models.
- Make a table.
- Find a pattern.

### Materials

- Chips or other counters

### Introduction

Students work with concrete materials to help them solve problems and to discover patterns to arrive at the solutions.

### Using the Pages

Encourage students to use chips or other counters to find several different ways that the chips could be put into the cans. Then as students use their *models* to try to list all of these ways, you may want to ask some of the following questions.

1. If you put 9 chips in the first can, how many chips would be in the second can? [1 chip]
2. If you took one chip out of the first can and put it in the second can, how many chips would be in each can? [8 in the first can, 2 in the second]
3. How many different ways could you put chips in the first can? [9 ways]

The different ways of putting chips in the two cans can be organized by *making a table* like the one shown below.

Number of chips in the first can	Number of chips in the second can
9	1
8	2
7	3
6	4
5	5
4	6
3	7
2	8
1	9

Students might make a table like the one above to solve Problems 5 and 6.

Table for Problem 5

Number of chips in the first can	Number of chips in the second can
11	1
10	2
9	3
8	4
7	5
6	6
5	7
4	8
3	9
2	10
1	11

(Continued on page 11.)

## Using Problem-Solving Strategies

Exploring Pairs of Addends

# ERIC'S GUESSING GAME

A guessing game was played at Eric's birthday party. Eric had put a total of 10 chips in two cans. Each can had at least one chip. A prize was won for guessing the correct number of chips in each can. *Show all the different guesses you could make.*



Use chips or other objects to show one way that the chips might be in the two cans.

1. If you put 3 chips in the first can and 7 chips in the second can, would 7 chips in the first can and 3 chips in the second can be another way?

**Yes**

2. List all of the different ways that the chips could be put in the cans.

**See Using the Pages.**





3. Use a table like the one below to list all the ways 10 chips could be put into two cans.

See Using the Pages.

Number of chips in the first can	Number of chips in the second can
9	1
8	—
7	—
6	—
.	.
.	.
.	.

4. How many ways are there to put the chips into 2 cans?  
**9 ways**
5. If there were 12 chips to put into 2 cans, how many different ways would there be?  
**11 ways**
6. If there were 15 chips to put into 2 cans, how many different ways would there be?  
**14 ways**
7. If there were 100 chips to put into 2 cans, how many different ways would there be?  
**99 ways**
8. Write a rule about the number of ways any number of chips can be put into 2 cans. **There are  $n-1$  ways to put  $n$  chips into 2 cans if each can contains at least 1 chip.**

## COMPUTER

### Ordering Events

For each activity, write the steps in order.

- Rinse dishes. **Scrape dishes.**  
Scrape dishes. **Wash dishes.**  
Dry dishes. **Rinse dishes.**  
Wash dishes. **Dry dishes.**
- Talk to person. **Look up number.**  
Dial number. **Dial number.**  
Look up number. **Ask for person.**  
Ask for person. **Talk to person.**
- Put bread in oven and bake.  
Find recipe and ingredients.  
Mix ingredients and preheat oven.  
Measure ingredients.  
**See margin.**
- Write the steps in order that you would use to set a table. **Answers will vary.**  
**See margin for sample answer.**



Using Problem-Solving Strategies, page 410 **11**

## Assignment Guide

basic	1–8
average	1–8
enriched	1–8

(Continued from page 10.)

There are 11 ways to put chips into the cans if there are 12 chips. Similarly, for Problem 6, there would be 14 ways to put 15 chips into 2 cans.

Students should find a pattern after solving Problems 3–6 and use it to solve Problem 7. If there were 100 chips, there would be 99 ways to put them into 2 cans.

Therefore, the rule that students should give for Problem 8 is that the number of ways to put chips into 2 cans is 1 less than the number of chips.

### Computer

Tell the class that a computer is a machine that does what it is told to do. The computer will follow directions in the order designated in the program. Therefore it is important to know the steps to use to perform a task.

Tell students that the computers usually found in homes and schools are called microcomputers. These are much smaller than computers of just a few years ago. Yet they have the capability to perform many times the number of tasks that older computers did.

### Follow-Up

#### Computer Assisted Instruction

Mathematics Courseware Series

- Addition and Subtraction 1, Activity 7

### Daily Maintenance

Write the numbers in order from least to greatest.

- 18 22 14 [14 18 22]
- 13 26 19 [13 19 26]
- 25 17 36 [17 25 36]
- 31 28 43 [28 31 43]
- 56 42 48 [42 48 56]
- 80 60 70 [60 70 80]

### Computer Answers, page 11

- Find recipe and ingredients.  
Measure ingredients.  
Mix ingredients and preheat oven.  
Put bread in oven and bake.
- Put tablecloth on table.  
Put dishes on table.  
Put glasses on table.  
Put silverware on table.

Using Problem-Solving Strategies, page 410



## Objective 5

Identify addition and subtraction sentences that belong to a family of facts.

### Materials

- Counters (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Give each student 3 red counters and 5 white counters. (The punchout counters are red on one side and white on the other.) Ask students what two addition facts are suggested by these counters. [ $3 + 5 = 8$  and  $5 + 3 = 8$ ] Then ask what two subtraction facts are suggested. [ $8 - 3 = 5$  and  $8 - 5 = 3$ ] These four facts make up a family of facts. Repeat this activity using different amounts of red and white counters.

## Using the Pages

**Teach** Write out the facts on the board for each family in Examples A and B. Stress that there is only one addition sentence and one subtraction sentence when two of the three numbers are the same unless one of the two numbers is zero. Then ask students what fact families they can form with the numbers 3, 4, and 7. Write  $3 + 4 = 7$  and  $4 + 3 = 7$  on the board. Then write  $7 - 4 = 3$  and  $7 - 3 = 4$ . Give students a second example with the numbers 12 and 6. Write  $6 + 6 = 12$  and  $12 - 6 = 6$ .

**Try** In Exercise a, ask students which number does not belong to the family. [0] In Exercise b, have students write the two addition facts in the family first.

**Practice Error Analysis** Watch for students who have difficulty deciding which fact does not belong to a fact family in Exercises 1–4. Point out to these students that the same three numbers must appear in each number sentence of a fact family. (See Reteaching 5.)

Exercise 13, 14, and 17 can generate only two sentences. Exercises 18 and 19, however, can generate four sentences.

### Answers, page 13

5.  $7 + 8 = 15$   
 $8 + 7 = 15$   
 $15 - 8 = 7$   
 $15 - 7 = 8$
7.  $3 + 6 = 9$   
 $6 + 3 = 9$   
 $9 - 6 = 3$   
 $9 - 3 = 6$
9.  $4 + 5 = 9$   
 $5 + 4 = 9$   
 $9 - 5 = 4$   
 $9 - 4 = 5$
6.  $7 + 3 = 10$   
 $3 + 7 = 10$   
 $10 - 7 = 3$   
 $10 - 3 = 7$
8.  $2 + 3 = 5$   
 $3 + 2 = 5$   
 $5 - 3 = 2$   
 $5 - 2 = 3$
10.  $6 + 8 = 14$   
 $8 + 6 = 14$   
 $14 - 8 = 6$   
 $14 - 6 = 8$

## Families of Facts

- A. These four number sentences make up a *family of facts*. The numbers used are 4, 6, and 10.



Use families of facts as a strategy to help you remember basic facts.



If you remember  $4 + 6 = 10$ , you can use the family of facts to remember  $6 + 4 = 10$ ,  $10 - 6 = 4$ , and  $10 - 4 = 6$ .



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## Practice 5

Name: \_\_\_\_\_ P5

One of the sentences does not belong to the family of facts. Circle the sentence that does not belong.

1. 13 8 5	2. 3 6 9	3. 4 7 11	4. 10 5 5
5. 8 13	9 6 3	7 4 11	5 5 0
13 5 8	6 3 3	11 4 7	5 5 10
8 5 3	9 3 6	11 7 4	
8 5 13	6 3 9	7 3 4	

Write a family of facts using the given numbers.

5. 9 7 16 $9 + 7 = 16$ $16 - 7 = 9$ $16 - 9 = 7$ $7 + 9 = 16$	6. 6 5 11 $6 + 5 = 11$ $11 - 5 = 6$ $11 - 6 = 5$ $5 + 6 = 11$	7. 4 8 $4 + 4 = 8$ $8 - 4 = 4$
8. 3 9 12 $3 + 9 = 12$ $12 - 9 = 3$ $12 - 3 = 9$ $9 + 3 = 12$	9. 3 8 11 $3 + 8 = 11$ $11 - 8 = 3$ $11 - 3 = 8$ $8 + 3 = 11$	10. 2 5 7 $2 + 5 = 7$ $7 - 5 = 2$ $7 - 2 = 5$ $5 + 2 = 7$
11. 9 6 15 $9 + 6 = 15$ $15 - 6 = 9$ $15 - 9 = 6$ $6 + 9 = 15$	12. 5 10 $5 + 5 = 10$ $10 - 5 = 5$	13. 4 7 11 $4 + 7 = 11$ $11 - 7 = 4$ $11 - 4 = 7$ $7 + 4 = 11$

## Reteaching 5

Name: \_\_\_\_\_ R5

Families of facts use the same numbers.

$\begin{array}{r} 4 \ 8 \ 12 \ 12 \\ + 8 \times 4 \ 4 \ 8 \\ \hline 12 \ 12 \ 8 \ 4 \end{array}$	We make a family!	Home Sweet Home
--	-------------------	-----------------

Find each answer. Circle the fact that does not belong to the family. Write its letter in the blank below.

1. $\begin{array}{r} 8 \ 8 \ 4 \ 12 \ 12 \\ - 4 \ 4 \ 8 \ 4 \ 8 \\ \hline 4 \ 12 \ 12 \ 8 \ 4 \end{array}$ D E W E Y	2. $\begin{array}{r} 6 \ 13 \ 7 \ 13 \\ - 7 \ 6 \ 7 \ 6 \ 6 \\ \hline 13 \ 1 \ 6 \ 13 \ 7 \end{array}$ M E G A N	3. $\begin{array}{r} 9 \ 2 \ 11 \ 9 \ 11 \\ + 2 \ 9 \ 9 \ 2 \ 2 \\ \hline 7 \ 11 \ 2 \ 11 \ 9 \end{array}$ N A N C Y
4. $\begin{array}{r} 8 \ 16 \ 8 \\ - 8 \ 8 \ 8 \\ \hline 0 \ 8 \ 16 \end{array}$ T O M	5. $\begin{array}{r} 6 \ 6 \ 12 \\ + 6 \ 6 \ 6 \\ \hline 12 \ 0 \ 6 \end{array}$ J I M	
6. $\begin{array}{r} 8 \ 13 \ 5 \ 13 \ 5 \\ + 5 \ 8 \ 8 \ 5 \ 5 \\ \hline 3 \ 13 \ 5 \ 13 \ 8 \end{array}$ S U S A N	7. $\begin{array}{r} 4 \ 7 \ 7 \ 4 \ 3 \\ + 3 \ 4 \ 3 \ 3 \ 4 \\ \hline 7 \ 3 \ 4 \ 1 \ 7 \end{array}$ G R E T A	

Who is always driving but never finds oil?

A exercise → 1 2 3 4 5 6 7



- b. Some families of facts have only two number sentences and use only two numbers.

$$8 + 8 = 16$$

$$16 - 8 = 8$$

### Try

- a. Tell which fact does not belong to the family.
- $8 + 0 = 8$
- $3 + 5 = 8$   
 $5 + 3 = 8$   
 $8 + 0 = 8$   
 $8 - 5 = 3$   
 $8 - 3 = 5$
- b. Write a family of facts using the given numbers.
- 7, 6, 13
- $7 + 6 = 13$   
 $6 + 7 = 13$   
 $13 - 7 = 6$   
 $13 - 6 = 7$

**Practice** Tell which fact does not belong to each family.

- |   |   |   |   |
|---|---|---|---|
| 1. $5 + 6 = 11$<br>$11 - 5 = 6$<br>$11 - 6 = 5$<br>$6 + 5 = 11$<br>$6 - 5 = 1$<br>$6 - 1 = 5$ | 2. $4 + 3 = 7$<br>$7 - 4 = 3$<br>$3 + 4 = 7$<br>$3 + 3 = 6$<br>$7 - 3 = 4$<br>$3 + 3 = 6$ | 3. $8 - 2 = 6$<br>$2 + 8 = 10$<br>$8 + 2 = 10$<br>$10 - 2 = 8$<br>$10 - 8 = 2$<br>$8 - 2 = 6$ | 4. $7 - 1 = 6$<br>$6 - 1 = 5$<br>$7 - 6 = 1$<br>$6 + 1 = 7$<br>$1 + 6 = 7$<br>$6 - 1 = 5$ |
|---|---|---|---|

Write a family of facts using the given numbers. **See margin.**

- |              |              |             |            |            |
|--------------|--------------|-------------|------------|------------|
| 5. 15, 7, 8  | 6. 7, 3, 10  | 7. 9, 3, 6  | 8. 5, 2, 3 | 9. 4, 9, 5 |
| 10. 6, 14, 8 | 11. 7, 12, 5 | 12. 1, 6, 5 | 13. 5, 10  | 14. 9, 18  |
| 15. 17, 8, 9 | 16. 5, 8, 13 | 17. 8, 16   | 18. 0, 4   | 19. 8, 0   |

## MAINTENANCE

Add or subtract.

- |   |   |   |  |   |   |   |
|---|---|---|--|---|---|---|
| 1. $\begin{array}{r} 13 \\ - 4 \\ \hline 9 \end{array}$ | 2. $\begin{array}{r} 11 \\ - 9 \\ \hline 2 \end{array}$ | 3. $\begin{array}{r} 7 \\ + 9 \\ \hline 16 \end{array}$ | 4. $\begin{array}{r} 3 \\ + 3 \\ \hline 6 \end{array}$ | 5. $\begin{array}{r} 12 \\ - 9 \\ \hline 3 \end{array}$ | 6. $\begin{array}{r} 10 \\ - 7 \\ \hline 3 \end{array}$ | 7. $\begin{array}{r} 5 \\ + 5 \\ \hline 10 \end{array}$ |
| 8. $2 + 6 = 8$  | 9. $9 - 6 = 3$  | 10. $15 - 8 = 7$  | 11. $4 + 8 = 12$                                       | 12. $7 + 3 = 10$  | 13. $14 - 8 = 6$  |   |
| 14. $17 - 9 = 8$  | 15. $4 + 9 = 13$  | 16. $3 + 5 = 8$   | 17. $4 - 0 = 4$  | 18. $7 - 7 = 0$   | 19. $6 + 9 = 15$  |   |
| 20. $1 + 8 = 9$   | 21. $8 + 8 = 16$  | 22. $5 + 6 = 11$  | 23. $11 - 5 = 6$                                       | 24. $14 - 7 = 7$  | 25. $18 - 9 = 9$  |   |

More Practice Set 5, page 353 13

## Assignment Guide

basic 1-17 even  
 average 1-17 odd  
 enriched 1-17 odd, 18, 19

**More Practice Set 5,**  
**page 353**

## Follow-Up

**Extra Practice** Have students do the unassigned exercises. Or you may wish to have them make up family-of-facts cards for the addition and subtraction facts.

**Reteaching** Have students draw 2 x's and 4 y's on their papers. Have them find the family of facts that describe the letters. [ $2 + 4 = 6$ ,  $4 + 2 = 6$ ,  $6 - 2 = 4$ ,  $6 - 4 = 2$ ]

## Computer Assisted Instruction

Mathematics Action Games  
 • Picture Parts, Harder Level

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- $5 + 9$  [14]
- $7 + 3$  [10]
- $2 + 5$  [7]
- $8 + 4$  [12]
- $6 - 5$  [1]
- $11 - 4$  [7]
- $15 - 6$  [9]
- $10 - 5$  [5]

## Answers, continued

- |  |  |
|--|--|
| 11. $7 + 5 = 12$<br>$5 + 7 = 12$<br>$12 - 7 = 5$<br>$12 - 5 = 7$ | 12. $1 + 5 = 6$<br>$5 + 1 = 6$<br>$6 - 5 = 1$<br>$6 - 1 = 5$     |
| 13. $5 + 5 = 10$<br>$10 - 5 = 5$                                 | 14. $9 + 9 = 18$<br>$18 - 9 = 9$                                 |
| 15. $8 + 9 = 17$<br>$9 + 8 = 17$<br>$17 - 9 = 8$<br>$17 - 8 = 9$ | 16. $5 + 8 = 13$<br>$8 + 5 = 13$<br>$13 - 8 = 5$<br>$13 - 5 = 8$ |
| 17. $8 + 8 = 16$<br>$16 - 8 = 8$                                 | 18. $0 + 4 = 4$<br>$4 + 0 = 4$<br>$4 - 0 = 4$<br>$4 - 4 = 0$     |
| 19. $8 + 0 = 8$<br>$0 + 8 = 8$<br>$8 - 0 = 8$<br>$8 - 8 = 0$     |  |

## Enrichment 5

Name \_\_\_\_\_ E5

**Patterns in Addition**

Facts such as  $3 + 3$ ,  $7 + 7$ ,  $6 + 6$ , and  $2 + 2$  are called **doubles**.

Numbers such as 6 and 7 are called **neighbors**. Their sum is 1 more than the double of 6.

$4 + 4 = 8$        $5 + 5 = 10$

$6 + 7 = 6 + 6 + 1$

1.  $7 + 8 = 1$  more than  $7 + 7$

2.  $3 + 4 = 1$  more than  $3 + 3$

3.  $5 + 4 = 4 + 1$

4.  $5 + 6 = 5 + 5 + 1$

This picture shows how adding 9 can be as easy as adding 10.

$9 + 3 = 10 + 2$

$6 + 9 = 5 + 10$

$8 + 4 = 10 + 3$

Use the pattern of Exercises 1-4 or the pattern of Exercises 5-9 to find these answers.

10.  $9 + 7 = 16$

11.  $9 + 2 = 11$

12.  $7 + 6 = 13$

13.  $8 + 9 = 17$

14.  $4 + 5 = 9$

15.  $4 + 9 = 13$

16.  $5 + 9 = 14$

17.  $8 + 7 = 15$

## Additional Resource 5

Name \_\_\_\_\_ Additional Resource 5

**Project Family of Facts Cards**

Materials needed: 12 index cards, pencil

Number of players: 2


1. On each index card, write one of the following facts:

$5 + 2 = 7$	$4 + 5 = 9$	$4 + 8 = 12$	$9 + 8 = 17$
$2 + 5 = 7$	$5 + 4 = 9$	$8 + 4 = 12$	$8 + 9 = 17$
$7 - 5 = 2$	$9 - 4 = 5$	$12 - 4 = 8$	$17 - 9 = 8$
$7 - 2 = 5$	$9 - 5 = 4$	$12 - 8 = 4$	$17 - 8 = 9$

2. Mix the cards well and lay them facedown in a pile. Each player draws one card from the pile. Each player then will try to complete the family of facts for the first card he or she draws.

3. Take turns drawing cards. If the card drawn fits in the family of facts for the first card you drew, keep the card. If not, lay the card facedown on a separate pile.

4. The first player to complete his or her family of facts wins. If neither player does so after all the cards have been drawn, mix the discarded pile of cards and draw cards from this pile.





**Objective 6** (Target Objective)  
Add three or more one-digit numbers.

### Lesson Theme

Careers: Zoo Keeper

### Materials

- Counters (Punchouts or Math Kit)

### Introduction

**Using Concrete Materials** Have students make groups of several objects, such as 7 pencils, 3 pencils, and 4 pencils. Have them count how many pencils are in all three groups. Write  $7 + 3 + 4 =$  on the chalkboard. Point out that to find the sum, it is necessary to add more than two numbers. Suggest that when adding more than two numbers, it is often helpful to group addends that equal 10 ( $7 + 3$  in this example) before adding another number or numbers. On the chalkboard, write  $7 + 3 = 10$ . Then write  $10 + 4 = 14$ .

**Warm-Up Review** Have students review the basic addition facts for 10.  $8 + 2$ ,  $4 + 6$ ,  $1 + 9$ ,  $5 + 5$ ,  $3 + 7$

### Using the Pages

**Teach Mental Math** Have students look for addends that equal 10 as you work through Examples A and B. together. The cat logo appears frequently throughout the student's text to remind students to use mental math strategies.

Other teaching examples:

$$6 + 7 + 4 [17]$$

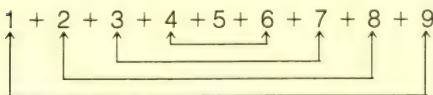
$$2 + 1 + 8 + 5 [16]$$

**Try** Point out that some exercises do not contain addends that equal 10, such as Exercises a and b.

**Practice Error Analysis** Watch for students who work the exercises too quickly and make careless errors. Have students check their answers by changing the order in which they add the numbers.

**Apply Problem Solving** Problem 21 is a multiple-step problem.

**Find a pattern** For Problem 22, you might suggest that the students show the sums of 10 like this:



### Three or More Addends

- A. Career** Shirley is the keeper at the penguin house. She takes care of 4 emperor penguins, 9 adelinie penguins, and 6 gentoo penguins. How many penguins does she care for?

Find  $4 + 9 + 6$ .

$$\begin{array}{r} 4 \\ 9 \\ + 6 \\ \hline 19 \end{array}$$

Look for a sum of 10.  
 $4 + 6 = 10$   
Then it is easy to add  $10 + 9$ .



Mental Math

Shirley cares for 19 penguins.

14

- B. Find**  $3 + 2 + 8 + 4$ .

$$\begin{array}{r} 3 \\ 2 \\ 8 \\ + 4 \\ \hline 17 \end{array}$$

Find a sum of 10.  $8 + 2 = 10$   
Find  $3 + 4$ .  $3 + 4 = 7$   
Add  $10 + 7$ .  $10 + 7 = 17$

### Practice 6

Name: \_\_\_\_\_ P6

Add

1. $\begin{array}{r} 3 \\ 9 \\ + 2 \\ \hline 14 \end{array}$	2. $\begin{array}{r} 5 \\ 5 \\ + 1 \\ \hline 11 \end{array}$	3. $\begin{array}{r} 9 \\ 2 \\ 5 \\ + 1 \\ \hline 17 \end{array}$	4. $\begin{array}{r} 3 \\ 0 \\ 4 \\ + 9 \\ \hline 16 \end{array}$
--	--	---	---

5.  $7 + 3 + 8 = 18$       6.  $2 + 6 + 7 + 1 = 16$

Which animal has the highest score? Penguin

Code															
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
3	2	4	4	1	2	4	1	5	3	4	1	5			
P	R	S	T	U	V	W									
5	2	1	5	2	8	9									

To find the score for each animal, find each letter in the name of the animal in the code. Add the number of points given for each letter. That total is the score for the animal.

7. CAT	8. PUFFIN	9. BEAVER	10. SEAL
_____	17	17	8
11. CAMEL	12. PANDA	13. LION	14. BEAR
15	16	14	8
15. OTTER	16. PENGUIN	17. DOG	18. OWL
18	19	13	17

### Reteaching 6

Name: \_\_\_\_\_ R6

Find  $9 + 8 + 1$

$$\begin{array}{r} 9 \\ 8 \\ + 1 \\ \hline 18 \end{array}$$

Look for numbers that add up to 10.  $9 + 1 = 10$   
Now add  $10 + 8$ .  $10 + 8 = 18$

We make adding easy!

What happens when you call a beekeeper?

Add. Write the letter that matches the answer in the blanks below.

1. $\begin{array}{r} 3 \\ 3 \\ + 3 \\ \hline 9 \end{array}$ Y	2. $\begin{array}{r} 5 \\ 1 \\ + 5 \\ \hline 11 \end{array}$ Z	3. $\begin{array}{r} 2 \\ 1 \\ + 2 \\ \hline 5 \end{array}$ G	4. $\begin{array}{r} 1 \\ 3 \\ + 3 \\ \hline 7 \end{array}$ O	5. $\begin{array}{r} 1 \\ 2 \\ + 1 \\ \hline 4 \end{array}$ E
6. $\begin{array}{r} 5 \\ 5 \\ + 2 \\ \hline 12 \end{array}$ N	7. $\begin{array}{r} 4 \\ 1 \\ + 2 \\ \hline 7 \end{array}$ G	8. $\begin{array}{r} 6 \\ 0 \\ + 4 \\ \hline 10 \end{array}$ S	9. $\begin{array}{r} 9 \\ 5 \\ + 1 \\ \hline 15 \end{array}$ L	10. $\begin{array}{r} 7 \\ 6 \\ + 4 \\ \hline 17 \end{array}$ U
11. $\begin{array}{r} 3 \\ 3 \\ + 3 \\ \hline 9 \end{array}$ A	12. $\begin{array}{r} 8 \\ 1 \\ + 1 \\ \hline 10 \end{array}$ Z	13. $\begin{array}{r} 8 \\ 3 \\ + 6 \\ \hline 17 \end{array}$ I	14. $\begin{array}{r} 4 \\ 7 \\ + 3 \\ \hline 14 \end{array}$ Y	15. $\begin{array}{r} 3 \\ 6 \\ + 7 \\ \hline 16 \end{array}$ U

OU GET A  
BUZZY SIGNAL



Try Add.

a.  $\begin{array}{r} 2 \\ 5 \\ +7 \\ \hline 14 \end{array}$  b.  $\begin{array}{r} 2 \\ 4 \\ +3 \\ \hline 9 \end{array}$  c.  $\begin{array}{r} 3 \\ 2 \\ +7 \\ \hline 12 \end{array}$  d.  $\begin{array}{r} 6 \\ 9 \\ 1 \\ +2 \\ \hline 18 \end{array}$  e.  $9 + 2 + 5 + 1 + 2 = 19$



Practice Add.

1.  $\begin{array}{r} 7 \\ 2 \\ +3 \\ \hline 12 \end{array}$  2.  $\begin{array}{r} 4 \\ 5 \\ +5 \\ \hline 14 \end{array}$  3.  $\begin{array}{r} 6 \\ 7 \\ +3 \\ \hline 16 \end{array}$  4.  $\begin{array}{r} 4 \\ 6 \\ +9 \\ \hline 19 \end{array}$  5.  $\begin{array}{r} 2 \\ 8 \\ +1 \\ \hline 11 \end{array}$  6.  $\begin{array}{r} 9 \\ 2 \\ +1 \\ \hline 12 \end{array}$   
7.  $\begin{array}{r} 3 \\ 6 \\ 3 \\ +4 \\ \hline 16 \end{array}$  8.  $\begin{array}{r} 6 \\ 2 \\ 5 \\ +4 \\ \hline 17 \end{array}$  9.  $\begin{array}{r} 3 \\ 4 \\ 5 \\ +5 \\ \hline 17 \end{array}$  10.  $\begin{array}{r} 8 \\ 2 \\ 1 \\ +3 \\ \hline 14 \end{array}$  11.  $\begin{array}{r} 1 \\ 6 \\ 3 \\ 1 \\ +2 \\ \hline 13 \end{array}$  12.  $\begin{array}{r} 4 \\ 5 \\ 3 \\ 2 \\ +1 \\ \hline 15 \end{array}$

13.  $7 + 5 + 1 = 13$  14.  $5 + 6 + 4 = 15$  15.  $7 + 1 + 6 + 3 = 17$   
16.  $2 + 2 + 3 + 9 = 16$  17.  $8 + 3 + 5 + 1 + 2 = 19$  18.  $5 + 3 + 5 + 3 + 2 = 18$

Apply Solve each problem.

19. In the morning, Nora cleaned 4 lion cages and 3 elephant cages. In the afternoon, she cleaned 6 cages. How many cages did she clean that day?  
**13 cages**
20. Sam fed 3 teaspoons of mush to a baby macaw in the morning, 4 teaspoons at noon, 5 teaspoons in the evening, and 6 teaspoons at night. How many teaspoons of mush did Sam feed to the macaw that day?  
**18 teaspoons**
- \*21. At one zoo there are 2 polar bears. There are 3 more brown bears than polar bears, and 2 more black bears than brown bears. How many bears are at this zoo?  
**14 bears**
22. **Thinking skills** Write  $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9$ . Look for sums of 10. What is the sum of the 9 digits?  
**45**

Using Problem-Solving Strategies, page 411  
More Practice Set 6, page 354 **15**

## Assignment Guide

basic 1–20 odd  
average 1–22 even  
enriched 1–21 odd, 22

More Practice Set 6,  
page 354

## Follow-Up

**Extra Practice** Write a number from 1–9 on each of thirty-six 3 x 5 index cards. Give each student two or three cards face down. On your signal, have students turn over their cards and add the numbers. The student who correctly adds the numbers on his or her cards the fastest is the winner of that round. The winner gets to mix up the pile, hand out a new set of cards, and give the signal for a new round to begin.

**Enrichment Mental Math** Have students write each number below as the sum of three one-digit numbers. Encourage students to use two addends that make a sum of 10. For example:  $17 = 8 + 7 + 2$ .

1. 17 2. 18 3. 15 4. 10  
5. 7 6. 11 7. 12 8. 13  
9. 16 10. 9 11. 14 12. 8

**Computer Assisted Instruction**  
Mathematics Courseware Series  
• Addition and Subtraction 2,  
Activities 5, 6

## Enrichment 6

Name \_\_\_\_\_ E6

**Magic Squares and Magic Stars**

Remember that a magic square has the same sum for each row, column, and diagonal. Fill in the missing numbers in these magic squares.

1.  $\begin{array}{|c|c|c|} \hline 2 & 9 & 4 \\ \hline 7 & 5 & 3 \\ \hline 6 & 1 & 8 \\ \hline \end{array}$  2.  $\begin{array}{|c|c|c|} \hline 3 & 2 & 7 \\ \hline 8 & 4 & 0 \\ \hline 1 & 6 & 5 \\ \hline \end{array}$  3.  $\begin{array}{|c|c|c|} \hline 12 & 5 & 10 \\ \hline 7 & 9 & 11 \\ \hline 8 & 13 & 6 \\ \hline \end{array}$

These magic squares each have one number wrong. Find the wrong number and correct it.

4.  $\begin{array}{|c|c|c|} \hline 2 & 16 & 6 \\ \hline 12 & 6 & 4 \\ \hline 10 & 0 & 14 \\ \hline \end{array}$  5.  $\begin{array}{|c|c|c|} \hline 9 & 6 & 19 \\ \hline 24 & 12 & 0 \\ \hline 3 & 18 & 15 \\ \hline \end{array}$  6.  $\begin{array}{|c|c|c|} \hline 16 & 19 & 4 \\ \hline 3 & 13 & 25 \\ \hline 22 & 7 & 10 \\ \hline \end{array}$

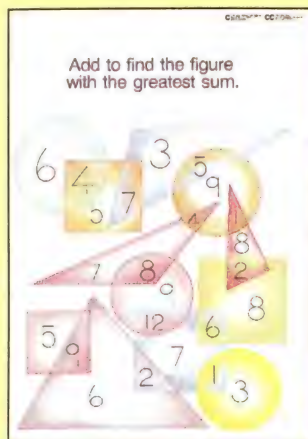
These are magic stars. The sum of the numbers on each line is the same as the sum of the numbers on the other lines.

7. What is the magic sum for this star? **58**

8. Find the missing numbers in this magic star.

$\begin{array}{c} 35 \\ \swarrow \quad \searrow \\ 17 \quad 9 \quad 11 \quad 21 \\ \swarrow \quad \searrow \\ 13 \quad 7 \\ \swarrow \quad \searrow \\ 1 \quad 25 \quad 27 \quad 5 \\ \swarrow \quad \searrow \\ 3 \end{array}$   $\begin{array}{c} 19 \\ \swarrow \quad \searrow \\ 10 \quad 6 \quad 7 \quad 12 \\ \swarrow \quad \searrow \\ 8 \quad 5 \\ \swarrow \quad \searrow \\ 2 \quad 14 \quad 15 \quad 4 \\ \swarrow \quad \searrow \\ 3 \end{array}$

## Additional Resource 6



### Math Poster C Three or More Addends

The circle in the center of the poster with a sum of 29 is the figure with the greatest sum. See Answer Key for other uses.

## Daily Maintenance

Write a family of facts using the given numbers.

1. 4, 6, 2 [ $2 + 4 = 6$ ,  $4 + 2 = 6$ ,  $6 - 2 = 4$ ,  $6 - 4 = 2$ ]  
2. 0, 5 [ $0 + 5 = 5$ ,  $5 + 0 = 5$ ,  $5 - 5 = 0$ ,  $5 - 0 = 5$ ]  
3. 16, 8 [ $8 + 8 = 16$ ,  $16 - 8 = 8$ ]  
4. 3, 5, 8 [ $3 + 5 = 8$ ,  $5 + 3 = 8$ ,  $8 - 3 = 5$ ,  $8 - 5 = 3$ ]  
5. 13, 6, 7 [ $6 + 7 = 13$ ,  $7 + 6 = 13$ ,  $13 - 7 = 6$ ,  $13 - 6 = 7$ ]  
6. 7, 15, 8 [ $7 + 8 = 15$ ,  $8 + 7 = 15$ ,  $15 - 7 = 8$ ,  $15 - 8 = 7$ ]

Using Problem-Solving  
Strategies, page 411



**Objective 7** (Target Objective)  
Solve problems by choosing addition or subtraction facts.

## Lesson Theme

School Activities: Zoo Field Trip

## Introduction

Advise students that there are many problem-solving approaches. Read them the following word problems:

1. I need to return 4 books to the public library, 6 books to the school library, and 2 books to Sue. How many books must I return in all? [12 books]
2. I want to send cards to 7 of my friends who have birthdays this month. I have 4 birthday cards. How many more do I need? [3 cards]

Ask students to describe the action in each problem. Then ask students what operation each action suggests. Finally, work through each method offered by the students.

## Using the Pages

**Teach** Tell students that this lesson introduces them to a five-step method of solving problems. List the five steps on the board and explain that students will be using these steps to solve word problems. Point out to students that when they must choose an operation, they are focusing on the *Plan* step. Then go through each step in the example with the students.

The penguin logo appears frequently throughout the student's text. The list of strategies reminds students of ways they can approach problems.

**Try** Have students solve Exercises a and b using the five-step method.

**Error Analysis** Watch for students having difficulty selecting the correct operation. Remind these students that joining action usually indicates the operation of addition. Separating action or comparisons usually indicate the operation of subtraction. (See **Reteaching 7**.)

**Apply Problem Solving** The *Plan* step is the focus of this lesson. Students must choose which operation to use. Ask questions that will focus on the action of the problem. Students should be able to see three distinct types of action: 1) joining (Problems 1, 3, 4, 7, 9, 10), 2) separating (Problems 6, 8), and 3) comparing and finding a difference (Problems 2, 5). After students have indicated the action, ask what operation that action suggests. Problems 1 and 2 encourage students to focus on the action described in the problem because the numbers have been omitted.

## Problem Solving

## Choose the Operation

When Mrs. Hadley's class visited the zoo, each student was assigned to a group. There were 6 students in Mrs. Hadley's group, 5 students in Mrs. Zeman's group, and 5 students in Mr. Cater's group. How many students in all went to the zoo?

**Read** Read the problem. What facts are given? What are you asked to find?

Facts: Groups of 6, 5, and 5 students  
Find: Number of students in all.

**Plan** What can you do to solve the problem?

Think of combining the groups into one group. Add to find how many in all. Find  $6 + 5 + 5$ .

**Solve** Carry out the plan.

$$\begin{array}{r} 6 \\ 5 \\ + 5 \\ \hline 16 \end{array}$$

**Answer** Answer the question.

There were 16 students who went to the zoo.

**Look Back** Read the question. Does the answer make sense?

The answer must be greater than the number in any of the groups. 16 is greater than 6 or 5. 16 is reasonable.

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.

### PROBLEM-SOLVING STRATEGIES

- CHOOSE THE OPERATION
- DRAW A PICTURE
- FIND A PATTERN
- WRITE AN EQUATION
- USE ESTIMATION
- USE LOGICAL REASONING
- LIST ALL POSSIBILITIES



## Practice 7

Items

Tell whether you **add** or **subtract**. Then find the answer.

1. Mr. and Mrs. Moore went to the art museum with their 2 children. The Moores also took 4 more children from the neighborhood. How many children in all went to the art museum with Mr. and Mrs. Moore?  
**Add**  
6 children
2. The group saw 6 statues made from marble and 11 statues made from copper. How many more copper statues than marble statues did they see?  
**Subtract**  
5 more statues
3. The children spent 5 hours at the museum. They spent 2 hours looking at statues before they looked at the other exhibits. How many hours did the children spend looking at the other exhibits?  
**Subtract**  
3 hours
4. In Room 318, the group saw 5 ink drawings that were almost a thousand years old. The group also saw 12 very old paintings. How many fewer drawings than paintings did they see in this room?  
**Subtract**  
7 fewer drawings
5. Robert bought 3 posters. Maria bought 7 smaller posters. Mike bought 1 large poster. How many posters did the children buy in all?  
**Add**  
11 posters
6. The group walked 8 yards from the museum store to the hallway. Then they walked another 8 yards from the hallway to the main door. How many yards did they walk from the museum store to the main door?  
**Add**  
16 yards

## Reteaching 7

Name: \_\_\_\_\_

Cage A had 6 monkeys.  
Cage B had 4 monkeys.  
How many more monkeys were there in all?  
 $6 + 4 = ?$   
 $6 + 4 = 10$   
There were 10 monkeys in all.

Solve each problem. Choose the correct operation from the box at the bottom.

1. The zoo had 5 tigers. 4 more tigers were bought. How many tigers were there in all?  
 $5 + 4 = ?$ ; 9 tigers
2. There were 6 hawks on the ground. 3 flew into a tree. How many hawks stayed on the ground?  
 $6 - 3 = ?$ ; 3 hawks
3. There were 4 yaks in one pen. 2 yaks were in another pen. How many yaks were there?  
 $4 + 2 = ?$ ; 6 yaks
4. There were 9 pigs. 7 were babies. How many pigs were adults?  
 $9 - 7 = ?$ ; 2 pigs
5. 1 seal was on a rock. 5 seals were in the pool. How many seals were there in all?  
 $1 + 5 = ?$ ; 6 seals
6. There were 7 goats. There were 4 sheep. How many more goats were there?  
 $7 - 4 = ?$ ; 3 more goats

Read carefully!

6 - 3 = ? 4 + 2 = ? 9 - 7 = ? 5 + 4 = ? 7 - 4 = ? 1 + 5 = ?



## Assignment Guide

basic	1–9, 11
average	1–9, 11
enriched	1–11

**More Practice Set 7,**  
page 354

**Homework to do with others** Have each student discuss with another person what costs should be included when planning a field trip to the zoo. Ask each student to find out the cost of one aspect of the field trip, for example, admission price to the Children's Zoo. Have each student report briefly on his or her findings.

## Follow-Up

**Extra Practice** Have students describe in their own words the steps in the problem-solving method. Review each description with the students to make sure they understand all the steps. Then have students put numbers in Exercises 1 and 2 and find the answers.

**Enrichment** Have students write original problems and then solve them using the five-step method. You may wish to have students exchange problems so that they get additional practice.

## Reading and Writing Mathematics

Write the following symbols on the board and have students write the meanings next to them: + [Plus], – [Minus], = [Equals], > [Greater than], < [Less than]

## Computer Assisted Instruction

Mathematics Courseware Series  
• Addition and Subtraction 2, Activity 9

## Cooperative Learning Groups

See page 474 of this Teacher's Edition.

## Daily Maintenance

1. $\begin{array}{r} 5 \\ 5 \\ + 7 \\ \hline [17] \end{array}$	2. $\begin{array}{r} 1 \\ 3 \\ + 9 \\ \hline [13] \end{array}$	3. $\begin{array}{r} 6 \\ 8 \\ + 4 \\ \hline [18] \end{array}$
4. $\begin{array}{r} 2 \\ 9 \\ + 8 \\ \hline [19] \end{array}$	5. $\begin{array}{r} 6 \\ 3 \\ + 7 \\ \hline [16] \end{array}$	6. $\begin{array}{r} 4 \\ 5 \\ + 1 \\ \hline [10] \end{array}$

**Try** Tell whether you *add* or *subtract*. Then find the answer.

- There are 9 boys and 7 girls in Mrs. Hadley's class. How many more boys than girls are there?  
**Subtract. 2 more boys**
- Pedro saw 6 sea lions. He saw 4 more seals than sea lions. How many seals did he see?  
**Add. 10 seals**

**Apply** Tell whether you would *add* or *subtract* to find the answer.

- Pamela saw 11 brown bears and 1 black bear. How many bears did she see in all?  
**Add.**
- Sharon saw 11 lions. Mark saw 1 lion. How many more lions did Mark see than Sharon?  
**Subtract.**
- Gina saw 8 geese in the pond at the children's zoo. Ana saw 6 more geese than Gina. How many geese did Ana see?  
**Add. 14 geese**
- Ann saw 13 snakes and 5 lizards in the reptile house. How many fewer lizards than snakes did she see?  
**Subtract. 8 fewer lizards**
- At the bird house, Paul saw 5 cockatoos. He saw 3 more parrots than cockatoos. How many parrots did he see?  
**Add. 8 parrots**
- There were 2 baby chimps, 1 baby squirrel, 3 bear cubs, and 1 tiger cub in the zoo nursery. How many animals were in the zoo nursery?  
**Add. 7 animals**
- Mr. Cater's group visited 3 areas of the zoo before lunch, and 4 areas after lunch. How many areas did they visit in all?  
**Add. 7 areas**
- The keeper said there were 15 camels. 7 of them were outside. How many camels were inside?  
**Subtract. 8 camels**
- Mrs. Zeman's group bought 12 bags of peanuts. They fed 8 bags to the monkeys. How many bags did they have left?  
**Subtract. 4 bags**
- The keeper gave each lion 2 chunks of meat that weighed 5 pounds each. How many pounds of meat did she give each lion?  
**Add. 10 pounds**

- Calculator** The 4 elephants at the zoo weigh 9,189 pounds, 7,976 pounds, 7,452 pounds and 8,048 pounds. What is the total weight of the elephants?  
**32,665 pounds**



## Enrichment 7

Name \_\_\_\_\_ E7

**Marble Equations**

Find each answer.

- Tommy and James were playing a marble game. Tommy had 12 marbles. James had 7 more marbles than Tommy. How many marbles did James have?  
**19 marbles**
- How many marbles did Tommy and James have all together?  
**31 marbles**
- Susie joined the game. She had 4 fewer marbles than James. How many marbles did she have?  
**15 marbles**
- How many marbles did all three children have?  
**46 marbles**
- James won 5 marbles from Susie. How many marbles did Susie have left?  
**10 marbles**
- What happened next? Fill in the last story. Provide a question and its answer.  
**Answers will vary.**

## Additional Resource 7

Name \_\_\_\_\_ Additional Resource 7

**Mental Math** Totaling Tens

Find the sum of all the numbers in each box. Add mentally by looking for numbers with a sum of 10.

Here's how you do it:

- $$\begin{array}{r} 1 & 4 & 9 \\ 3 & & 6 \\ \hline \text{Total: } 23 \end{array}$$
- $$\begin{array}{r} 5 & 7 & 2 \\ 3 & & 8 \\ \hline \text{Total: } 25 \end{array}$$
- $$\begin{array}{r} 9 & 4 & 3 \\ 7 & & 6 \\ \hline \text{Total: } 30 \end{array}$$
- $$\begin{array}{r} 5 & 3 & 2 \\ 7 & 5 & 8 \\ \hline \text{Total: } 30 \end{array}$$



## Objective 8

Find missing addends.

### Lesson Theme

Recreation: Zoo Tram Ride

### Materials

- Counters (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Show students a box that contains 6 counters they cannot see. Tell them that there are some counters in the box, but do not say how many. Tell them that  $n$  will represent the number of counters in the box. Add 3 counters to the box, and then ask a student to count all the counters now in the box. [9] Ask them how many counters were originally in the box. [ $n$ ] How many counters were added? [3] How many counters in all? [9] Have students write a number sentence to show this information. [ $n + 3 = 9$ ] Ask how to find  $n$  in  $n + 3 = 9$ . [Subtract]

## Using the Pages

**Teach** Read the problem and point out that  $n$  means the number you want to find. Discuss how the number sentence is set up from the information. Ask the class if the equation makes sense. [Yes] Have the students read the solution. Ask if the answer, 15, is sensible, if it fits into the number sentence. [Yes] Explain that although the missing addends are in addition number sentences, the process used to find the addend is subtraction.

**Try** Have students explain why  $n$  can be either the first or second addend. [The order in which two numbers are added does not change the sum.]

**Practice Error Analysis** Watch for students who add the numbers instead of subtracting one from the other. Encourage students to substitute the answer for  $n$  to see if it makes sense. In Exercise 1, for example, ask students "Does  $6 + 19 = 13$ ?" [No] "Does  $6 + 7 = 13$ ?" [Yes] Have students write subtraction problems for each exercise as shown in Reteaching 8.

**Apply Problem Solving** Let students use counters or draw pictures to solve the problems if necessary.

## Missing Addends

When the tour started, there were 6 passengers on Nick's tram. At the first stop, no one got off the tram. After the first stop, there were 15 passengers on board. How many passengers boarded the tram at the first stop?

Write a number sentence. Use  $n$  for the number that boarded at the first stop.

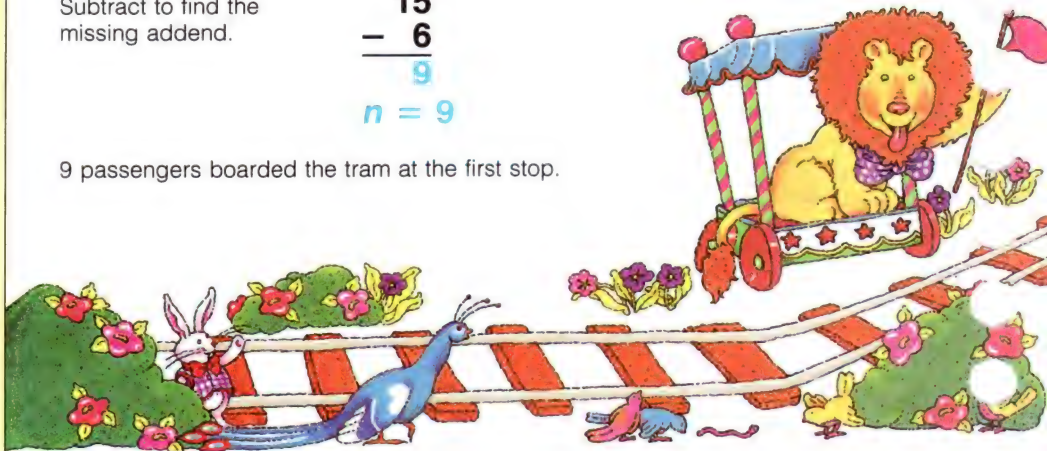
Number on board at the start      Number that boarded at the first stop      Number on board after the first stop

$$6 + n = 15$$

Subtract to find the missing addend.

$$\begin{array}{r} 15 \\ - 6 \\ \hline 9 \\ n = 9 \end{array}$$

9 passengers boarded the tram at the first stop.



**Try** Give each missing addend.

a.  $3 + n = 7$   
 $n = 4$

b.  $n + 5 = 9$   
 $n = 4$

c.  $9 + n = 11$   
 $n = 2$

d.  $n + 8 = 15$   
 $n = 7$

**Practice** Give each missing addend.

1.  $6 + n = 13$   
 $n = 7$

2.  $7 + n = 11$   
 $n = 4$

3.  $n + 2 = 5$   
 $n = 3$

4.  $n + 6 = 8$   
 $n = 2$

5.  $n + 5 = 10$   
 $n = 5$

6.  $n + 9 = 17$   
 $n = 8$

7.  $5 + n = 7$   
 $n = 2$

8.  $1 + n = 5$   
 $n = 4$

9.  $9 + n = 9$   
 $n = 0$

10.  $0 + n = 0$   
 $n = 0$

11.  $n + 4 = 10$   
 $n = 6$

12.  $n + 4 = 12$   
 $n = 8$

13.  $n + 7 = 8$   
 $n = 1$

14.  $n + 3 = 4$   
 $n = 1$

15.  $8 + n = 16$   
 $n = 8$

16.  $7 + n = 14$   
 $n = 7$

17.  $n + 9 = 18$   
 $n = 9$

18.  $n + 8 = 13$   
 $n = 5$

19.  $5 = 5 + n$   
 $n = 0$

20.  $2 = 2 + n$   
 $n = 0$

18

## Practice 8

Name: \_\_\_\_\_ P8

Give each missing addend.

1. $7 + n = 10$ $n = 3$	2. $n + 8 = 9$ $n = 1$	3. $4 + n = 13$ $n = 9$
4. $n + 5 = 13$ $n = 8$	5. $n + 6 = 6$ $n = 0$	6. $n + 8 = 10$ $n = 2$
7. $n + 9 = 18$ $n = 9$	8. $7 + n = 11$ $n = 4$	9. $2 + n = 9$ $n = 7$
10. $3 + n = 8$ $n = 5$	11. $n + 6 = 16$ $n = 10$	12. $8 + n = 17$ $n = 9$
13. $n + 0 = 4$ $n = 4$	14. $5 + n = 6$ $n = 1$	15. $9 + n = 14$ $n = 5$

Complete the wheels by finding the missing addends. All sums should equal the middle number.

## Reteaching 8

Name: \_\_\_\_\_ R8

Find the missing addends.

$7 + \square = 10$   
 $\begin{array}{r} 10 \\ - 7 \\ \hline 3 \end{array}$   
 $\square = 3$   
 $7 + 3 = 10$

$4 + n = 9$   
 $\begin{array}{r} 9 \\ - 4 \\ \hline 5 \end{array}$   
 $n = 5$   
 $4 + 5 = 9$

Give each missing addend.

1. $2 + n = 2$ $n = 0$	2. $n + 1 = 7$ $n = 6$	3. $5 + n = 8$ $n = 3$	4. $n + 4 = 11$ $n = 7$
5. $n + 1 = 2$ $n = 1$	6. $1 + n = 9$ $n = 8$	7. $n + 5 = 10$ $n = 5$	8. $3 + n = 6$ $n = 3$
9. $2 + n = 6$ $n = 4$	10. $n + 3 = 5$ $n = 2$	11. $8 + n = 10$ $n = 2$	12. $n + 2 = 9$ $n = 7$
13. $n + 3 = 12$ $n = 9$	14. $6 + n = 11$ $n = 5$	15. $n + 7 = 10$ $n = 3$	16. $9 + n = 17$ $n = 8$
17. $7 + n = 12$ $n = 5$	18. $n + 8 = 14$ $n = 6$	19. $6 + n = 6$ $n = 0$	20. $n + 8 = 13$ $n = 5$



## Assignment Guide

basic	1–18 even
average	1–18 odd, 21–22
enriched	1–18 even, 19–22

**More Practice Set 8,**  
page 354

### Calculator, page 19

The same "calculator rule" can make many different lists of numbers. For example, the rule  $\boxed{+} 6 \boxed{=}$  can make the following lists.

0	6	12	18	24	30
5	11	17	23	29	35
10	16	22	28	34	40

Have students find other lists using the rule  $\boxed{+} 6 \boxed{=}$ . Have them explain what they had to do to make the different lists. [Start the list with a different number.] Ask students how they can tell if a list of numbers has a  $\boxed{+}$  rule or a  $\boxed{-}$  rule. [The numbers become larger when a  $\boxed{+}$  rule is used and smaller when a  $\boxed{-}$  rule is used.]

Some students may want to devise their own "calculator rules" and see if other students can discover the "rule" to find missing numbers in a list of numbers.

### Follow-Up

**Reteaching** Have students work backwards to arrive at the answer. This should reinforce the idea of subtracting to find  $n$ . Ask the students how many people were on Nick's tram after the first stop. [15] How many were on board when the tour started? [6] How many people boarded at the first stop? [9] What did you have to do to find the answer? [Subtract]

### Computer Assisted Instruction

Mathematics Courseware Series

- Addition and Subtraction 2, Activity 9, Extra for Experts

### Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- |                 |                 |
|-----------------|-----------------|
| 1. $12 - 8$ [4] | 2. $5 - 3$ [2]  |
| 3. $9 - 6$ [3]  | 4. $18 - 9$ [9] |
| 5. $15 - 7$ [8] | 6. $10 - 4$ [6] |

### Answers, page 19

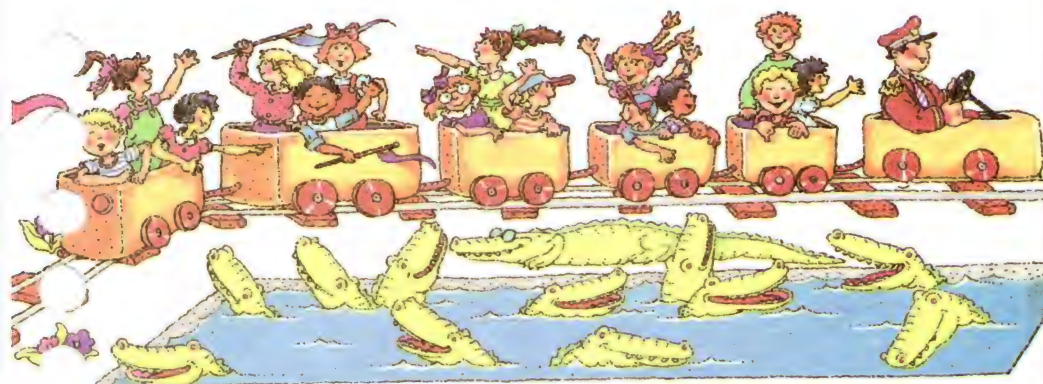
#### Calculator

- |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|
| 1. $\boxed{+} 4 \boxed{=}$ | 2. $\boxed{-} 2 \boxed{=}$ | 3. $\boxed{-} 3 \boxed{=}$ |
| 4. $\boxed{+} 3 \boxed{=}$ | 5. $\boxed{-} 4 \boxed{=}$ | 6. $\boxed{+} 5 \boxed{=}$ |
| 7. $\boxed{+} 9 \boxed{=}$ | 8. $\boxed{-} 8 \boxed{=}$ | 9. $\boxed{+} 6 \boxed{=}$ |

**Apply** Solve each problem.

21. Last year, the zoo tram stopped at 9 different areas on each tour. Now it stops at 13. How many new stops were added?  
( $9 + n = 13$ ) **4 new stops**

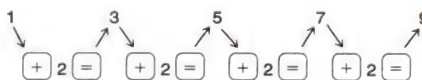
22. The reptile house received 5 new crocodiles. Now there are 12. How many crocodiles were there before?  
( $n + 5 = 12$ ) **7 crocodiles**



## CALCULATOR

Here is a list of numbers. Tell what rule was used each time to get the next number.

1 3 5 7 9  $\boxed{+} 2 \boxed{=}$  is the rule.



For each list, use your calculator to find the rule and the missing numbers. **See margin for rules.**

- |                               |                                 |                                       |
|-------------------------------|---------------------------------|---------------------------------------|
| 1. 0 4 8 12 <b>16 20</b>      | 2. 17 15 13 <b>11 9</b>         | 3. 18 15 12 <b>9 6</b>                |
| 4. 1 4 <b>7 10</b> 13         | 5. <b>23 19</b> 15 11 <b>7</b>  | 6. 0 <b>5 10</b> 15 <b>20</b>         |
| 7. <b>0</b> 9 18 <b>27 36</b> | 8. <b>64 56</b> 48 40 <b>32</b> | 9. <b>8</b> 14 <b>20</b> 26 <b>32</b> |

More Practice Set 8, page 354 **19**

## Enrichment 8

Name \_\_\_\_\_ E8

**The Missing Digits Case**

Find the missing digits.

1. $\begin{array}{r} 2 \boxed{6} \\ + 4 \ 3 \\ \hline 6 \ 9 \end{array}$	2. $\begin{array}{r} 5 \boxed{2} \\ - 7 \ 1 \\ \hline 1 \ 2 \ 3 \end{array}$	3. $\begin{array}{r} 8 \ 4 \\ - \boxed{3} \ 1 \\ \hline 5 \ 3 \end{array}$
4. $\begin{array}{r} 1 \ 5 \ 9 \\ - \boxed{8} \ 4 \\ \hline 7 \ \boxed{5} \end{array}$	5. $\begin{array}{r} 1 \boxed{3} \ 6 \\ - 5 \ 2 \\ \hline 9 \ \boxed{4} \end{array}$	6. $\begin{array}{r} 1 \ \boxed{2} \ \boxed{2} \\ - 7 \ 2 \\ \hline 5 \ 6 \end{array}$
7. $\begin{array}{r} 2 \ \boxed{5} \\ + 8 \ 2 \\ \hline \boxed{1} \ \boxed{0} \ 7 \end{array}$	8. $\begin{array}{r} \boxed{3} \ 6 \\ + 2 \ 9 \\ \hline 6 \ 5 \end{array}$	9. $\begin{array}{r} \boxed{4} \ 7 \\ + 3 \ 7 \\ \hline 8 \ \boxed{4} \end{array}$
10. $\begin{array}{r} 5 \ \boxed{4} \\ - 2 \ 8 \\ \hline 8 \ 2 \end{array}$	11. $\begin{array}{r} \boxed{3} \ \boxed{6} \\ + 3 \ 9 \\ \hline 7 \ 5 \end{array}$	12. $\begin{array}{r} 9 \ 5 \\ - \boxed{3} \ \boxed{6} \\ \hline 5 \ 9 \end{array}$
13. $\begin{array}{r} 8 \ \boxed{2} \\ - \boxed{1} \ 7 \\ \hline 6 \ 5 \end{array}$	14. $\begin{array}{r} 5 \ 3 \ \boxed{5} \\ - \boxed{2} \ 8 \ 3 \\ \hline 2 \ \boxed{5} \ 2 \end{array}$	15. $\begin{array}{r} 2 \ \boxed{6} \ 1 \\ + 4 \ 8 \ \boxed{2} \\ \hline \boxed{7} \ 4 \ 3 \end{array}$

## Additional Resource 8

Name \_\_\_\_\_ Additional Resource 8

**Calculator Magic Triangles**

Use me to make magic triangles. Here's how:

Use only the numbers 2, 4, 6, 8, 10, and 12 as addends. The sum of the three numbers on each side of the triangle must equal the number in the middle.

To find the missing addend on the side of the triangle with 10 and 4, press 20  $\boxed{\div}$  10  $\boxed{=}$  4. You see 6. To check your answer, press 6  $\boxed{+}$  10  $\boxed{+}$  4  $\boxed{=}$ . You see 20.

Find the other two missing addends above. Record the key sequences used.

1. 20  $\boxed{\div}$  **10**  $\boxed{\div}$  **2**  $\boxed{=}$  **8**  
2. 20  $\boxed{\div}$  **6**  $\boxed{\div}$  **2**  $\boxed{=}$  **12**

Find the missing addends for the magic triangle below. Record the key sequences used.

3. 24  $\boxed{\div}$  **12**  $\boxed{\div}$  **2**  $\boxed{=}$  **10**  
4. 24  $\boxed{\div}$  **10**  $\boxed{\div}$  **6**  $\boxed{=}$  **8**  
5. 24  $\boxed{\div}$  **12**  $\boxed{\div}$  **8**  $\boxed{=}$  **4**



## Chapter 1 Test

An acceptable score for each objective is suggested in the Chapter 1 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

Objective	Test items	Text pages
1	1, 2	2-3
2	3-7	4-5
3	8-16	6-7
4	17-25	8-9
5	26, 27	12-13
6	28-30	14-15
7	31-33	16-17
8	34, 35	18-19

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
35	100	26	74
34	97	25	71
33	94	24	69
32	91	23	66
31	89	22	63
30	86	21	60
29	83	20	57
28	80	19	54
27	77	18	51

### Additional Ideas for Evaluation

See pages 464-467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 1 Form for Individualizing
- Cumulative Record Folder

## Chapter 1 Test

Tell if the number in each picture is used to count, to measure, to order, or to label.

1.



Label

2.



Measure

3. Write a number sentence to compare 5 and 26. Use  $>$ .

$$26 > 5$$

4. Write a number sentence to compare 61 and 26. Use  $<$ .

$$26 < 61$$

Write the numbers in order from least to greatest.

5. 72 65 85

$$65 \ 72 \ 85$$

6. 21 10 19 8

$$8 \ 10 \ 19 \ 21$$

7. 87 95 83 92

$$83 \ 87 \ 92 \ 95$$

Add.

$$\begin{array}{r} 8. \ 6 \\ + 4 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 9. \ 7 \\ + 6 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 10. \ 4 \\ + 5 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 11. \ 8 \\ + 6 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 12. \ 5 \\ + 7 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 13. \ 9 \\ + 8 \\ \hline 17 \end{array}$$

$$14. \ 7 + 4$$

$$11$$

$$15. \ 5 + 3$$

$$8$$

$$16. \ 9 + 0$$

$$9$$

Subtract.

$$\begin{array}{r} 17. \ 7 \\ - 2 \\ \hline 5 \end{array}$$

$$20$$

$$\begin{array}{r} 18. \ 14 \\ - 6 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 19. \ 8 \\ - 0 \\ \hline 8 \end{array}$$

$$26. \ 4 + 2 = 6$$

$$2 + 4 = 6$$

$$6 - 4 = 2$$

$$6 - 2 = 4$$

$$27. \ 5 + 6 = 11$$

$$6 + 5 = 11$$

$$11 - 6 = 5$$

$$11 - 5 = 6$$

$$\begin{array}{r} 20. \ 15 \\ - 8 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 21. \ 12 \\ - 7 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 22. \ 18 \\ - 9 \\ \hline 9 \end{array}$$

$$23. \ 16 - 7$$

$$9$$

$$24. \ 13 - 5$$

$$8$$

$$25. \ 11 - 3$$

$$8$$

Write a family of facts using the given numbers. See above.

$$26. \ 4, 2, 6$$

$$27. \ 5, 6, 11$$

Add.

$$\begin{array}{r} 28. \ 9 \\ + 1 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 29. \ 3 \\ + 4 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 30. \ 8 \\ + 4 \\ + 2 \\ + 5 \\ \hline 19 \end{array}$$

Tell whether you *add* or *subtract*. Then solve each problem.

31. There were 7 boys and 8 girls at the party. How many children were at the party?

Add. 15 children

32. In the first game, 9 runs were scored. 4 runs were scored in the second game. How many more runs were scored in the first game than in the second game?

Subtract. 5 more runs

33. A bird laid 5 eggs. Only 3 eggs hatched. How many eggs did not hatch?

Subtract. 2 eggs

Give each missing addend.

$$34. \ n + 8 = 13$$

$$n = 5$$

$$35. \ 3 + n = 9$$

$$n = 6$$

## Chapter 1 Letter Home

### Keeping You Posted

In mathematics, we have been studying addition facts through 9 + 9 and subtraction facts through 18 - 9. The activity below will help your child practice these facts. You also might use flashcards for these facts to review answers with your child. We will study numbers and place value next.

To: Family

Can you find the path that leads to Mars?

Work each exercise. Then draw the path through the spaces that have a 9 in the answer.

## Chapter 1 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

### Posttest Chapter 1

Tell if the number in each picture is used to count, to measure, to order, or to label.

1. To measure

2. To label

3. Write a number sentence to compare 9 and 28. Use  $>$ .

4. Write a number sentence to compare 67 and 28. Use  $<$ .

Write the numbers in order from least to greatest.

5. 70 57 73

6. 22 13 17 8

7. 85 91 82 94

Add.

8.  $3 + 7$

9.  $8 + 7$

10.  $2 + 6$

11.  $7 - 5$

12.  $6 - 8$

13.  $8 - 9$

14.  $8 + 5$

15.  $4 + 4$

16.  $8 - 0$

Subtract.

17.  $6 - 3$

18.  $14 - 5$

19.  $7 - 0$

### Posttest Chapter 1

Subtract

To: Family

20.  $11 - 8$

21.  $12 - 8$

22.  $17 - 9$

23.  $15 - 9$

24.  $11 - 5$

25.  $12 - 3$

Write a family of facts using the given numbers.

26. 4 1 5

27. 5 3 8

Add.

28.  $7 + 5$

29.  $2 + 6$

30.  $7 + 5$

28.  $5 - 4 = 1, 5 - 1 = 4$

29.  $4 + 1 = 5, 1 + 4 = 5$

30.  $8 - 5 = 3, 8 - 3 = 5$

31.  $5 + 3 = 8, 3 + 5 = 8$

Tell whether you *add* or *subtract*. Then solve each problem.

32. In the first game, 8 runs were scored. 7 runs were scored in the second game. How many more runs were scored in the first game than in the second game?

33. A bird laid 5 eggs. Only 2 eggs hatched. How many eggs did not hatch?

Give each missing addend.

34.  $n + 5 = 14$

35.  $2 + n = 8$



# CHALLENGE

## Number Patterns

An interesting sequence of numbers was discovered by the famous mathematician, Fibonacci.

The Fibonacci sequence begins with these numbers.

1 1 2 3 5 8 13 . . .

More numbers in this sequence can be found by using an addition pattern.

Answer each question to help you find the pattern.

1. What is the sum of the first and second numbers of the sequence?  
2
2. What is the third number of the sequence?  
2
3. What is the sum of the second and third numbers of the sequence?  
3

4. What is the fourth number of the sequence?  
3

5. What is the sum of the third and fourth numbers of the sequence?  
5

6. What is the fifth number of the sequence?  
5

7. What pattern do you see?

**Add 2 consecutive numbers to get the next number.**

8. Write the next four numbers in the Fibonacci sequence.

1 1 2 3 5 8 13 ■ ■ ■ ■  
21 34 55 89

9. Find the addition pattern in this sequence.

1 1 1 3 5 9 17 . . .

**Add 3 consecutive numbers to get the next number.**

10. Find the next four numbers in the sequence in Exercise 9.

31 57 105 193



21

## Challenge

**Find a pattern** Students should see the pattern by the time they have answered question 7. Help students who need more explanation to see the pattern by writing these problems on the board and have them find the sums.

1	1	2	3	5	8
+1	+2	+3	+5	+8	+13
2	3	5	8	13	21

Have students compare the addends to the numbers in the Fibonacci sequence. [The addends are 2 consecutive numbers in the sequence.] Have students compare the sums to the numbers in the sequence. [The sums are the same as numbers in the sequence beginning with the third number.] Ask students what the next two addition problems would be. [13 + 21 = 34 and 21 + 34 = 55] After the students recognize and understand the number pattern ask the following questions. What is the difference of the seventh and sixth numbers in the sequence? [5] What is the fifth number in the sequence? [5] What is the difference of the sixth and fifth numbers in the sequence? [3] What is the fourth number in the sequence? [3] What is the difference of the fifth and fourth numbers in the sequence? [2] What is the third number in the sequence? [2] What pattern do you see? [Subtract 2 consecutive numbers and get the number that precedes them in the sequence.] Why does this pattern occur? [Subtraction is the inverse operation of addition.] For an additional activity, students can develop original number-pattern sequences and give the sequences their own family names; for example, the "Smith" sequence or the "Miller" sequence.



## Using Problem-Solving Strategies

- Use physical models.
- Draw a picture.

### Introduction

Students use physical models and pictures to find the solutions to the problems.

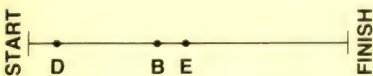
### Using the Page

Ask questions to make sure students understand the difference between *behind* and *right behind*. "If Runner H is behind J, can there be anyone between them? [Yes] If H is right behind J, can anyone be between them?" [No]

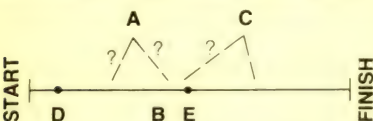
"In Problem 1, can there be anyone between Runners C and A?" [Yes]

A motivating way to present this problem is to have five students act it out. Or, students can use *physical models* such as scraps of paper labeled A, B, C, D, and E.

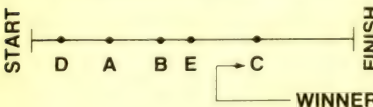
Have students read the problem several times and *draw* on their *pictures* to show the position of the runners. [For Problem 1, the information that "Runner B was right behind E, Runner D finished last . . ." can be shown on a picture.



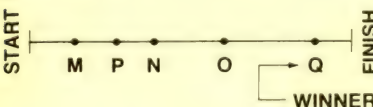
For Problem 2, warn the students that not all information can be directly marked on a picture. For instance, ". . . C was ahead of A" does not tell where C and A are in relation to E and B.



The last sentence gives this picture.



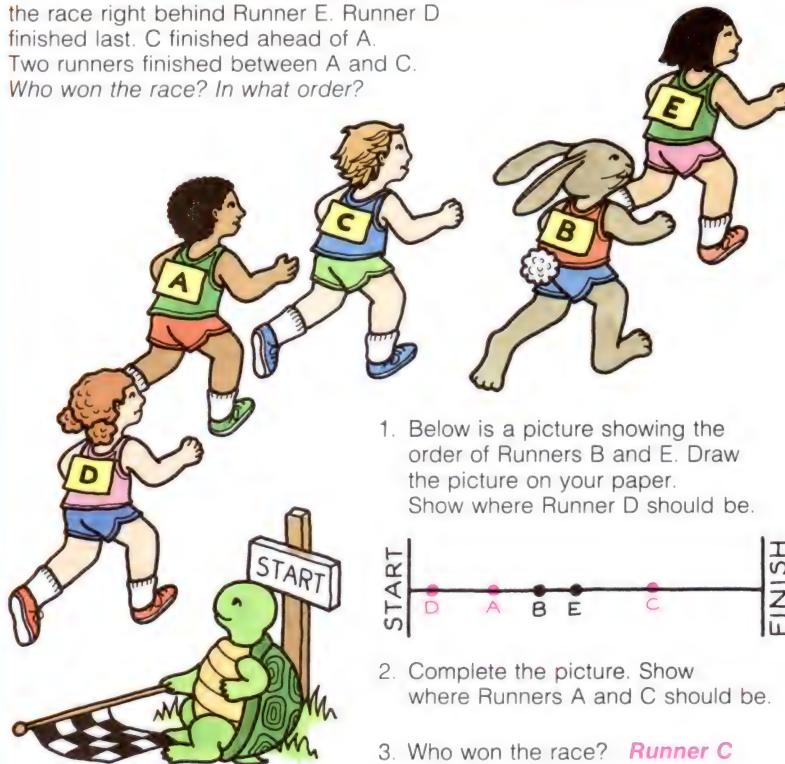
To answer Problem 4, use the same procedure.



## Using Problem-Solving Strategies

# RACE RESULTS

Five friends ran in a race. Runner B finished the race right behind Runner E. Runner D finished last. C finished ahead of A. Two runners finished between A and C. Who won the race? In what order?



- Below is a picture showing the order of Runners B and E. Draw the picture on your paper. Show where Runner D should be.



- Complete the picture. Show where Runners A and C should be.

- Who won the race? **Runner C**

- In another race among 5 runners, O finished ahead of both P and M. N finished right behind O. Two runners finished between Q and P. In what order did they finish? Who won the race?  
**Q, O, N, P, M; Q won.**





# chapter 2

## Numbers and Place Value

### Mathematical Background

**Place Value** Our number system is a base-ten system of place value because we use ten digits (0 through 9) and assign values to the digits according to their location within a number.

We also refer to this as a decimal system, which comes from the Latin word *decima*, which means "to tithe," or to give a tenth of one's income. The decimal system is based on the rule that each digit has a value ten times the value of the digit to its right.

For example, consider the number 245. The "5" represents 5 units (ones); the "4" represents 40 units, or 4 tens; and the "2" can be considered to be 200 units, 20 tens, or 2 hundreds. The place values of a number read, from left to right, thousands-hundreds-tens-ones.

### Comparing and Ordering Numbers

To compare numbers using place value, emphasis must be given to two properties in *priority* order: (1) the number of digits and (2) the value of the digits at specific places in the number.

Comparing 2,567 and 895, 2,567 is greater because it has four digits and 895 has only three. The values of the first digits (2 and 8) are not considered in determining which is greater.

If two numbers, such as 2,567 and 5,289, have the same number of digits, *then* the second property is used to determine which is greater. In this case, 5,289 is greater because 5 *thousand* is greater than 2 *thousand*. The properties should be used in the correct order.

The same properties are used to order numbers. Numbers with the fewest digits are the least, and if two numbers have the same number of digits, then they are compared by examining the digits from left to right.

**Rounding Numbers** In rounding numbers to a specific place value, only the digit to the immediate right needs to be considered. For example, 2,363 is rounded to 2,400 when rounding to the hundreds place, because of the "6" in the tens place.

### Contents

Digits and Numbers	24–25
Hundreds, Tens, and Ones	26–27
Thousands	28–29
Comparing Numbers	30–31
Ordering Numbers	32–33
Rounding: Nearest Ten and Nearest Hundred	34–35
<b>Maintenance</b>	35
Rounding: Nearest Hundred and Nearest Thousand	36–37
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<b>Computer</b>	39
Problem Solving: Use a Table	40–41
Ten-Thousands and Hundred-Thousands	42–43
Millions	44–45
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<b>Challenge: Billions</b>	49
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### Pretest for Chapter 2

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 2**

Use digits to write each number.

1. 12      2. twelve      3. forty

Write each number in standard form.

4. 2 hundreds 6 tens 8 ones      4. 268

5. seven hundred ten      5. 710

6.  $7,000 \div 800 + 40 + 5$       6. 7,845

7. five thousand, seven hundred eight      7. 5,708

8.  $80,000 \div 3,000 + 600 \div 50 + 4$       8. 83,654

9. three hundred six thousand      9. 306,000

10. two million, five hundred thirty thousand, eight hundred thirty-four      10. 2,530,834

Tell what the 5 means in each number.

11. 756      12. 5.081      11. Five tens

13. 956,103      14. 5,348,901      12. Five thousands

15. Five ten-thousands

16. Five millions

Compare the numbers. Use < or >.

15. 781 > 775

16. 7,849 > 3,018

17. 6,870 > 6,890

Write the numbers in order from least to greatest.

18. 563 498 612      18. 498 563 612

19. 253 248 258 347      19. 248 253 258 347

20. 6,547 6,652 5,539      20. 5,539 6,547 6,652

3

Name \_\_\_\_\_

**Pretest Chapter 2**  
continued

Round to the nearest ten.

21. 67      22. 463      21. 70

22. 460

Round to the nearest hundred.

23. 530      24. 3,869      23. 500

24. 3,900

Round to the nearest thousand.

25. 3,392      26. 6,582      25. 3,000

26. 7,000

Use this table to solve each problem.

Name of county	Population	Land area in square miles
Oskosh	685	1,935
Oswald	2,254	2,124

27. Find the population of Oswald County to the nearest hundred.      27. 2,300

28. Which of the two counties shown has the greater land area?      28. Oswald

Choose the most sensible answer.

29. The smallest class in Kendall School has 20 students. How many students are in the largest class?      29. 30

30. The 4 third-grade classes went on a field trip. How many students went?      30. 90

9 90 900

4



# Teaching Chapter 2



## Problem Solving

**Five-Step Method** In this chapter, students encounter many opportunities to focus on the READ step and to solve problems by obtaining information from a table. This is an important skill for students to learn. Point out to your students that making and using a table is an efficient way to organize a wealth of information. This technique can free their thinking so that they can implement other problem-solving strategies, such as *Finding a pattern* or *Using logical reasoning*. Pages 46–47 focus on the LOOK BACK step by providing valuable practice in *giving Sensible Answers*.

Refer to the *Problem-Solving Questioning Guide* on pages 438–439 for some general questions you can use to guide students through any word problem. It is a good idea to keep asking the questions in the *Guide*, so that students will form the habit of asking themselves these questions and thus become independent problem solvers.

**Problem-Solving Strategies** The nonroutine problems in the *Using Problem-Solving Strategies* features on pages 38–39, 50, 412, and 413, and **Math Posters D** and **F** give students a chance to *Use physical models*, *Try and check*, *Find a pattern*, *Make a table*, and *List all possibilities*.

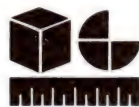
Establishing a problem-solving bulletin board in your classroom is a good way to provide continued emphasis on developing problem-solving skills and strategies. Each Monday, you might post a copy of one of the problems found in the *Using Problem-Solving Strategies* section in the back of the text. Challenge your students to solve the problem by Friday. Other bulletin boards can be made by posting some data concerning people, places, or things and then giving students a week to solve a problem based on that data. Students will need to organize the information in a variety of ways and develop a means of analyzing and interpreting the information.



## Estimation and Mental Math

**Estimation** In this chapter, students learn to *round* numbers to the nearest ten, hundred, and thousand. Mastering this skill prepares students for estimating sums, differences, and products, using rounded numbers.

Students also decide which answer is most sensible for various word problems. Students eliminate unreasonable options and select the most reasonable of the remaining options. This lesson builds student number sense and should help them decide when their own answers to problems make sense.



## Concrete Materials

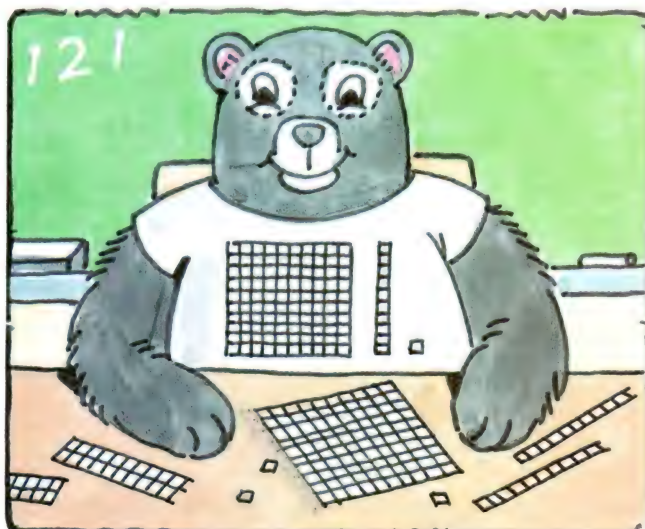
To help students understand place value better, they should have a variety of experiences using concrete materials. Counters in groupings of thousands, hundreds, tens, and ones, can be used often. Along with grid paper and the counters available in the Punchouts and Math Kit, different-colored strips of paper can be used effectively to teach place value. Students can use counters alone to display given numbers, or they can place the counters in a place-value chart.

The bear which appears throughout the book is a good reminder for students that concrete materials are very valuable to use for understanding place value and computation. Be sure that students feel free to use concrete materials when working in any phase of mathematics. On page 28, have students describe the picture on the bear's shirt. [1 hundred, 1 ten, and 1 one]

If students have used *Invitation to Mathematics* previously, this bear may remind them of the bear used in the earlier books to explain place value.

At this age, students may not have internalized well, abstract concepts such as ordering, comparing, and rounding. Using concrete materials, for example, number lines, will build a firm foundation for these concepts, improve student skills, and increase their confidence in their ability to do well in mathematics.

Be sure that students verbalize what they are doing. This not only provides you with feedback on each student's progress toward understanding, but it is an invaluable aid to the students in organizing and clarifying their own thoughts and understanding.



Using concrete materials will help students understand place value and computation.





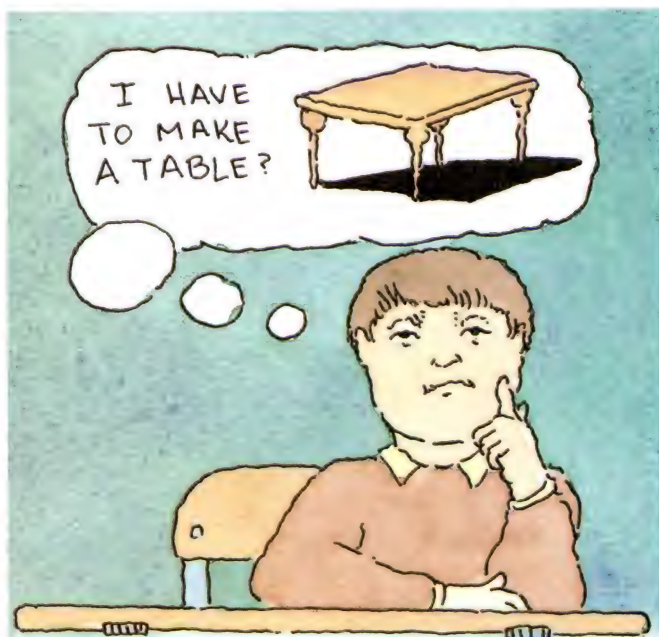
## Calculators and Computers

**Calculators** Throughout this chapter, calculators can be used to reinforce place-value concepts (5 in the tens place equals 50). **Additional Resource 14** gives students an opportunity to practice these concepts. After mastering this sheet, students may want to create their own place-value word examples.

For extra challenge, you may want to allow students to explore larger numbers—such as 1 million or 1 billion—with calculators. If your calculators have a constant function, students can use it to “count” to 1 million by hundreds (or thousands) by pressing 100  $+$   $=$   $=$   $=$  and so on, testing how long it takes them to reach 1 million.

**Computers** **Additional Resource 13** introduces computer programs. A program is a set of *numbered* instructions that tell the computer what is to be performed. These instructions are stored in memory. Instructions without a line number are not stored in memory.

There are three important operating system commands that are frequently used and do not get line numbers. These are: RUN, LIST, and NEW. These are not BASIC statements and are not part of a program. RUN executes a program. LIST allows the operator to see the program as it is being typed before one runs it. NEW clears the memory of the computer. NEW should *always* be typed before a new program is entered into the computer.



Watch for words like “rounded” and “table” which have different meanings in everyday life. Give examples that help students understand.



## Teaching Techniques

**Questioning and Responding** When you ask questions about place value to check on students’ understanding, be sure to sometimes ask the question while holding objects or pictures of objects. Instruct students to answer the same way. You or they may say “4 tens,” but you won’t know for sure if they understand what that means unless you use objects.

**Helping Students Read and Write Mathematics** As students try to read large numbers, point out that they need to look at the entire number to see how many digits it has before they can read the number correctly from left to right. When students write large numbers, remind them to insert commas correctly and ask them to make the commas large enough to be clearly visible.

**Teaching Students with Special Needs** Gifted students can benefit from looking at numeration systems other than our own. This can create a better understanding of our own numeration system, and provide insight into the historical development of arithmetic. For example, ask your students to investigate the Roman numerals system: Where are Roman numerals used today? When did people stop using Roman numerals and switch to Arabic numerals? What are the differences between the two systems? Encourage students to attempt to make a place-value chart for the Roman numerals system. Elicit their suggestions as to how to show the ones place, the tens place, and so on.

**Relating Mathematics to Other Subjects** Many of the lessons in the book relate mathematics to other school subjects such as art, health, music, reading, science, and social studies. Here is a list of these kinds of lessons for Chapter 2.

**Music:** school band (46–47)

**Social Studies:** population (28–29, 36–37), population and land area (40–41), cotton production (42–43, 44–45)



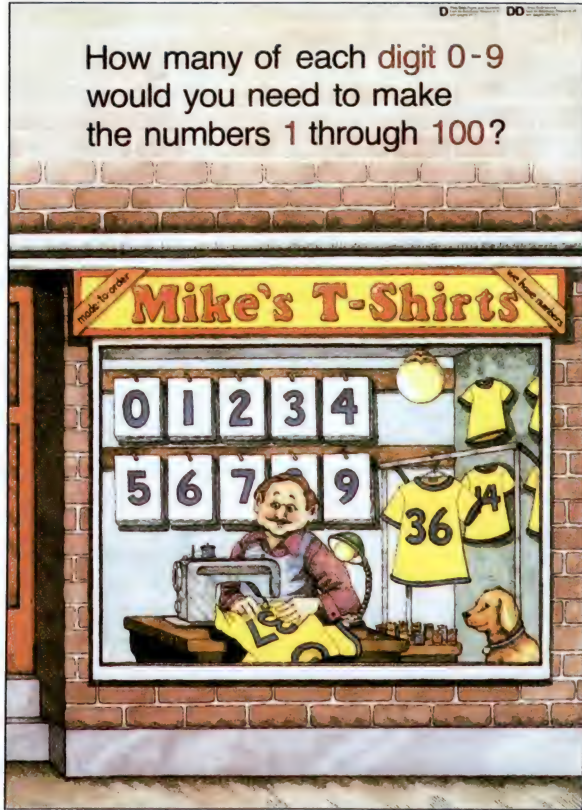
## Thinking Skills

In this chapter, students follow rules and procedures for comparing and rounding numbers. They understand why these rules work because of a strong foundation in **comprehending concepts** related to place value. The Thinking Skills exercise on page 45 challenges students to apply concepts they have learned. Students **analyze relationships** as they do the *Using Problem-Solving Strategies* features on pages 38–39, 50, 412, and 413, and as they focus on giving sensible answers on pages 46–47.

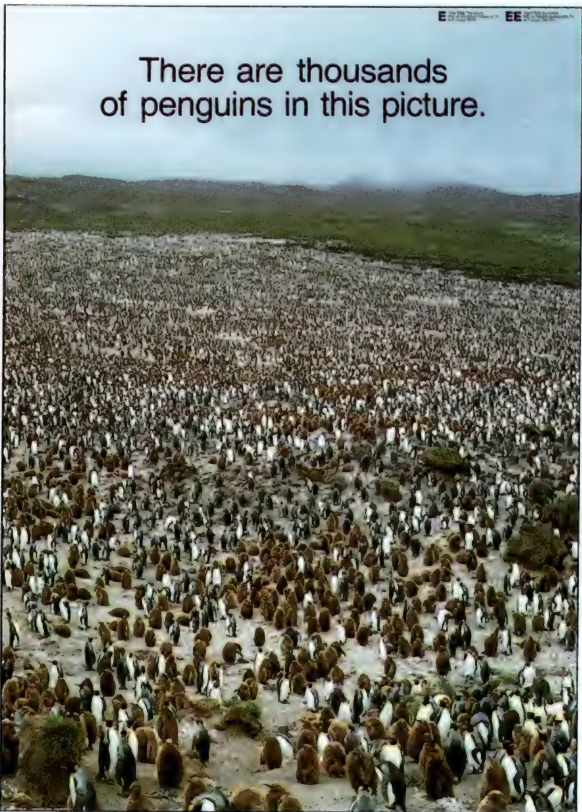


## Bulletin Board Suggestions

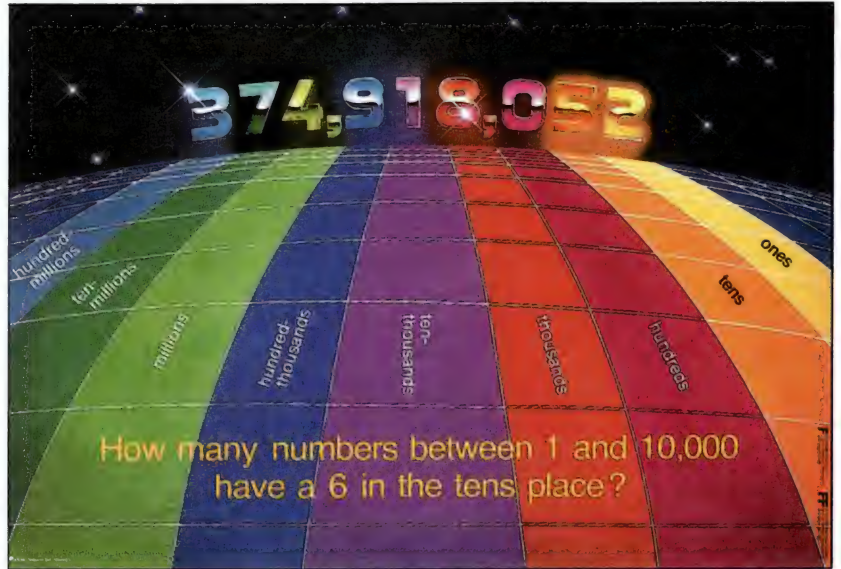
The posters shown here can be used with Chapter 2. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster D



Math Poster E



Math Poster F

## Materials Chapter 2

- Circular fraction models (Punchouts) 24–25
- Construction paper 24–25
- Beans 24–25
- Paper clip 24–25
- Place-value charts (Teaching Aid C) 26–29, 42–45
- Cards (2 sets, 0–9) 27, 32–33, 42–45
- Straws 26–27
- Common objects 26–27
- Hundreds, tens, units (Punchouts or Math Kit) 28–31, 46–47
- Number lines (Teaching Aid A) 30–37
- Classroom objects 32–33
- Road maps 34–35
- Newspaper or magazine 34–35
- Cards (1–6) 38–39
- School calendar 40–41
- Grid paper 40–41
- Overhead projector 40–41, 46–47



#### Basic Situation

Use the picture on this page to help begin a discussion about inventing different ways of representing the number of objects. Read the story to introduce the situation, and then have students invent their own codes for other students to break.

#### Possible Problems

- What type of symbols might be used to represent hundreds, tens, and ones?
- How could the code be changed so that 4-digit or 5-digit numbers could be represented?
- What questions should be asked to break a code most efficiently?

#### Indicators of Success

To solve the problem in the story, students may approach it in many different ways. At first, they may guess numbers at random. ("Is it more than 400?") Watch to see if they begin to see that they only need to ask if it is more than 500 or 700. (They know that it is more than 300.)

As students make up their own codes, they will need to decide how to display them. They may decide to draw a poster or to make a sheet with several problems on it.

Students may discuss whether zeros may be a part of the number to be represented. See if students conclude that our place-value system, where the value of each digit is determined by its position, is easier to use than these coded systems.

#### Ways to Help

Encourage students to keep a record of their questions and eliminate possible answers.

If students have trouble beginning to invent a code, you may want to suggest that they use a code similar to one given in the story.

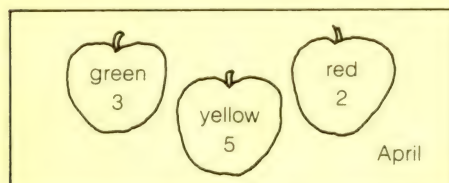
Encourage students to try to invent codes which use schemes other than different colors or different fruit. They might try different shapes, shapes within shapes, different sized numerals, and so on.



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

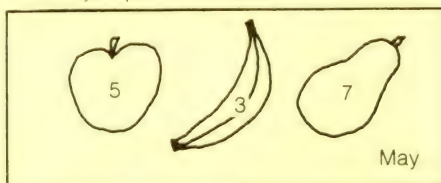
#### Story to Introduce the Situation

Granny Smith and her grandson, Jonathan, ran the biggest apple orchard in Apple Valley. Mac Intosh, who owned the orchard nearby, was trying to make his the largest orchard. He was always trying to find out how many apples Granny had raised. So Jonathan decided to report the number of apples with a code. He drew a picture like this:



When he showed it to Granny, she said, "Let me see. Did we raise 352 bushels of apples in April?" "No," said Jonathan, "but you are on the right track. The red stands for hundreds, the green stands for tens, and the yellow stands

for ones." "Ah," said Granny, "we had 235 bushels." When Mac asked how they did in April, Jonathan showed him the picture. Mac thought, "What does he mean 3 green, 2 red, and 5 yellow?" Not wanting to ask directly, he asked, "Did you raise more than 500 bushels?" "No," said Jon. Soon, Mac caught on to the system, so Jonathan changed the May report to look like this:



By asking whether the number shown is more or less than some number, can you determine which symbol represents hundreds? tens? ones? [In May, Granny raised 735 bushels of apples.]



## Objective 9

Write one-digit and two-digit numbers.

### Lesson Theme

School Activities: Running Laps

### Vocabulary

Digit, ones digit, tens digit

### Materials

- Beans
- Construction paper
- Paper clips or bobby pins
- Fraction models (Punchouts)

### Introduction

Explain to students that tallies are a way of counting. Write "||||" represents 8" on the chalkboard. Stress that each tally mark has a value of one. Then point out that whenever a tally mark crosses four others, it shows a group of five.

### Using the Pages

**Teach** In Example A, point out that the numbers used to summarize the tallies are all one-digit numbers. For Example B, explain that the numbers from 10 to 99 are two-digit numbers.

Students are periodically asked to work with other students. Before students begin their group work in Example C, you might want to have them open their books to pages 438–441 for a discussion on group work. The corresponding section is found on pages 470–473 in this Teacher's Edition.

After a discussion on group work, have students get into groups of 4. For Example C, point out that groups may choose any method they wish to count the beans. Have each group explain their methods to the class. As students write the total number, have them indicate the ones digit and the tens digit in their numbers as shown on page 24.

For Example D, suggest that groups try other sets of two digits to see if their generalizations hold true in all cases.

Read through Example E with students. Explain to students that since the spinner must be separated into 10 equal parts (an equal part for each of the 10 digits 0 through 9), they can use their fraction models for tenths to help them make the spinner. For the third step, explain that each player should declare the number of spins he or she will take before spinning. Emphasize that the object of the game is to make the greatest two-digit number. Note what students do when they get a zero as one of their spins. Discuss such (Continued on page 25.)

## Digits and Numbers

Letters are used to write words.  
**Digits** are used to write numbers.  
0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 are all the digits that are used.

**A.** During a five-minute run, Amy made a tally of the number of laps run by each team member. Then she used digits to write each number.

NAME	TALLY	LAPS
DOROTHY		4
AMBROSE	I	6
JILL		3
GUADALUPE	II	7
GREG		5

**B.** John wrote this two-digit number to show that the entire team ran a total of **twenty-five** laps.

**25**

tens digit    ↑    ones digit

24

### Practice 9

Name \_\_\_\_\_

Write the ones digit for each number.

1. 18 8    2. 40 0    3. 24 4    4. 81 1  
5. 27 7    6. 72 2    7. 98 8    8. 36 6

Write the tens digit for each number.

9. 74 7    10. 56 5    11. 60 6    12. 43 4  
13. 91 9    14. 12 1    15. 78 7    16. 23 2

Using the given digits, write as many two-digit numbers as you can. Do not repeat a digit in a number.

17. 5 and 9    18. 6 and 4    19. 8 and 3    20. 9 and 2  
59 95    64 46    83 38    92 29

Use digits to write each number.

21. fifty-six    22. twelve    23. ninety-one    24. twenty  
56    12    91    20

This table shows a tally sheet for the number of lawns mowed by each child. Use digits to show totals.

Name	Tally	Total
Mare		4
Eam		5
Lemore		5
Jeff		5

### Reteaching 9

Name \_\_\_\_\_

How many marks are there?

ones digit    tens digit    ones digit    tens digit

Use digits to show each number.

1. ||| 3    2. |||| 4  
3. |||| 4    4. |||| | 5  
5. |||| | 5    6. |||| | 5  
7. |||| | 5    8. |||| | 5

Write the ones digit for each number.

9. 12 2    10. 41 1    11. 33 3  
12. 27 7    13. 64 4    14. 96 6  
15. 65 5    16. 48 8    17. 50 0  
18. 71 1    19. 53 3    20. 29 9

Write the tens digit for each number.

21. 54 5    22. 91 9    23. 83 8  
24. 20 2    25. 17 1    26. 66 6  
27. 78 7    28. 49 4    29. 34 3



## Assignment Guide

basic	1–7
average	1–7
enriched	1–7

**More Practice Set 9,  
page 355**

(Continued from page 24.)

combinations as 02 and 05. Have students explain that if they were to write a zero in the tens place, it would indicate that there are no tens. Therefore, a number written as 02 or 05 would signify 2 or 5. Ask students where they would write the digit 0 in order to write the greatest two-digit number. [In the ones place]

For Problem 7, explain to students that now they will make three-digit numbers, so that the strategy used with a zero becomes even more important in deciding which digit to write in each box. Ask students to discuss what 015 indicates. [The number 15, since the zero is in the hundreds place means that there are no hundreds]

When groups have finished playing the game and its variations, have students explain their strategies to the class.

## Follow-Up

**Extra Practice** Have students write two-digit numbers such as their weight in pounds and their height in inches. Have them identify the ones digits and the tens digits in these numbers.

## Reading and Writing Mathematics

Read each sentence to students and have them tell whether the sentence is *true* or *false*. In 46, 6 is the tens digit. [False] In 73, 3 is the ones digit. [True] In 721, 1 is the ones digit. [True] In 302, 2 is the tens digit. [False]

## Computer Assisted Instruction

Mathematics Courseware Series

• Numeration 1, Activities 3, 4

## Daily Maintenance

Give each missing addend.

- $6 + n = 8$  [ $n = 2$ ]
- $n + 1 = 5$  [ $n = 4$ ]
- $3 - 3 = n$  [ $n = 0$ ]
- $n + 7 = 11$  [ $n = 4$ ]
- $9 + n = 17$  [ $n = 8$ ]
- $6 = n + 3$  [ $n = 3$ ]

**Answers, page 25**

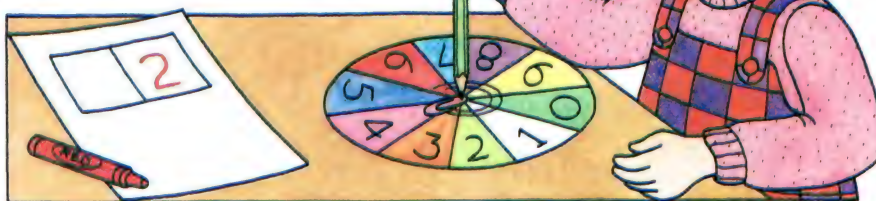
**See page 49 of this Teacher's Edition.**

- c. Work with three other students. Turn to pages 438–441 for help on group work. Each student in your group should put two handfuls of beans into one pile. Count the beans. When you are finished counting, discuss these questions. **See margin.**

- How did you count the beans?
- How can you show the total number of beans without using digits?

Now write the total number of beans using digits.

- When is it useful to use tally marks?
- When is it useful to use digits?



- e. Play a digit game with your group.
- Make a spinner that shows the digits 0–9.
  - Each player draws two boxes that are next to each other.
  - Players take turns spinning the spinner 2, 3, or 4 times. Players will write two of the digits from their spins in the boxes to make a two-digit number.
  - For each spin, players must decide if they want to write the number in a box. They must also decide which box is the best box to write the number in.
  - The player who makes the greatest two-digit number wins the game.

Try to play the game so that the player with the least number wins the game.

Try to play the game using three digits out of four spins.

- How is it different to play the game this way?  
**See Using the Pages.**

More Practice Set 9, page 355 **25**

## Enrichment 9

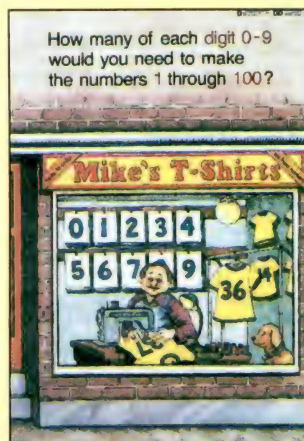
Name \_\_\_\_\_ E9

**Amazing Animals**

Use the clues to complete the statements.

- A rabbit can weigh as much as 11 kilograms.
  - The number is between 10 and 50.
  - The sum of the digits is 2.
  - The digits are the same.
- A cat lived for 35 years.
  - The ones digit is 2 more than the tens digit.
  - The sum of the digits is 8.
- A monarch butterfly can fly 1,829 meters high.
  - The ones digit is 7 more than the tens digit.
  - The hundreds digit is 4 times the tens digit.
  - The tens digit is 2.
  - The number is between 1,000 and 2,000.
- Dolphins can jump out of water 549 centimeters.
  - The sum of the hundreds digit and the tens digit is the ones digit.
  - The tens digit is 1 less than the hundreds digit.
  - The ones digit is 9.
- The great royal python may grow to be as long as 10 meters.
  - The number is between 5 and 20.
  - The ones digit is 1 less than the tens digit.

## Additional Resource 9



### Math Poster D Digits and Numbers

The number of times each digit is needed is as follows: 0 [11], 1 [21], 2 [20], 3 [20], 4 [20], 5 [20], 6 [20], 7 [20], 8 [20], 9 [20].



## Objective 10

Write numbers and give the place value for any digit in a number through 999.

### Lesson Theme

School Activities: Class Work

### Vocabulary

Standard form

### Materials

- Place-Value Charts (Teaching Aid C)
- Straws
- Cards (2 sets, 0–9)
- Common objects

## Introduction

**Using Concrete Materials** Have students demonstrate the greatest two-digit number using objects; for example, 9 bundles of ten straws and 9 single straws. Then have students display the number using the digit cards. Have them add a straw and discuss what number is 1 greater than 99. It is 10 tens, 0 ones; or 1 hundred, 0 tens, 0 ones. Have students use the digit cards to display that number. Emphasize the importance of zero as a place-holder.

## Using the Pages

**Teach** In Example A relate the pictures to the place-value chart. Ask how many hundreds [1], how many tens [2], and how many ones [8] for each. Give other three-digit numbers, such as 164, and ask students to first draw pictures to demonstrate the number and then give the standard form.

**Try Error Analysis** In Exercises a–c, watch for students who omit the needed zero. Have students use place-value charts to write their answers.

**Practice** In Exercises 1–18, let those students having difficulty write each number in a place-value chart.

**Error Analysis** Watch for students who write *and* in Exercises 21 and 22. Have these students practice reading numbers aloud for a few minutes each day. (See Reteaching 10.)

**Apply Problem Solving** Remind students to be sure to use all three digits, 4, 6, and 1, in each of Problems 26–29.

**List all possibilities** For Problems 30 and 31, suggest that students list all the numbers they can that begin with 2 [295, 259], then those that begin with 5 [529, 592], and those that begin with 9 [925, 952].

## Hundreds, Tens, and Ones

- A. Ted and Claudia each drew a picture to show the number of fourth graders in Bay School. Each picture shows 1 hundred, 2 tens, and 8 ones.

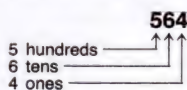
hundreds	tens	ones
1	2	8

1 hundred 2 tens 8 ones

**128** ← Standard form

one hundred twenty-eight

- B. What does each digit mean in 564?



26

## Practice 10

Name \_\_\_\_\_ P10

Write each number in words:

- 256 Two hundred fifty-six
- 81 Eighty-one
- 702 Seven hundred two
- 999 Nine hundred ninety-nine

Write what the 5 means in each number:

- 75 5 ones
- 815 5 ones
- 509 5 hundreds
- 456 5 tens

Write what the 2 means in each number:

- 872 2 ones
- 123 2 tens
- 52 2 ones
- 290 2 hundreds

Write each number in standard form:

- Two hundred seven 207
- Eighty 80
- Three hundred ten 310
- Fifty-five 55
- Four hundred fifty-seven 457
- 2 hundreds 6 tens 7 ones 267
- Five hundred eighty-nine 589
- Seven hundred thirty-six 736
- 4 hundreds 3 tens 8 ones 438
- Six hundred nineteen 619

## Reteaching 10

Name \_\_\_\_\_ R10

Write the standard form:

hundreds	tens	ones
3	2	4

three hundred twenty-four

Write the standard form:

- 245
- 151

Write the standard form:

- 6 hundreds 8 tens 5 ones 685
- 3 tens 4 hundreds 2 ones 432
- 1 ten 0 ones 5 hundreds 510
- 7 ones 8 tens 3 hundreds 387

Tell what the 4 means in each number:

- 473 4 tens
- 604 4 ones
- 241 4 tens
- 488 4 hundreds
- 492 4 hundreds
- 140 4 tens







## Objective 11 (Target Objective)

Write numbers and give the place value for any digit in a number through 9,999.

### Lesson Theme

Social Studies: Population

### Vocabulary

Expanded form

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Place-Value Charts (Teaching Aid C)

## Introduction

**Using Concrete Materials** Write the number 23 on the board and ask a student to display this number for the class using base ten blocks. Show that it can be written as  $20 + 3$ . Do the same with 46, 99, 403, and 571.

**Motivational Situation** Have the students name four imaginary towns that have the following populations:

9,874 5,021 1,876 429

Discuss and compare the differences in population. [Which town would you expect to be quietest? Where would you want to live?] Then ask the students to write these numbers in expanded form.

## Using the Pages

**Teach** Extend the activity in the *Introduction* section to include thousands. Explain that 10 hundreds is equal to 1 thousand. Stress the relationship between expanded form and standard form. The bear logo appears throughout the student's text to remind students of the place-value concepts they know.

**Try Error Analysis** Exercises a, b, c, and e use zeros to show place value. Watch for students who have difficulty doing these exercises. For these students, list ten numbers in expanded form on the board. Make sure that at least five will have zeros when written in standard form. Have students write the numbers in place-value charts. (See *Reteaching 11*.)

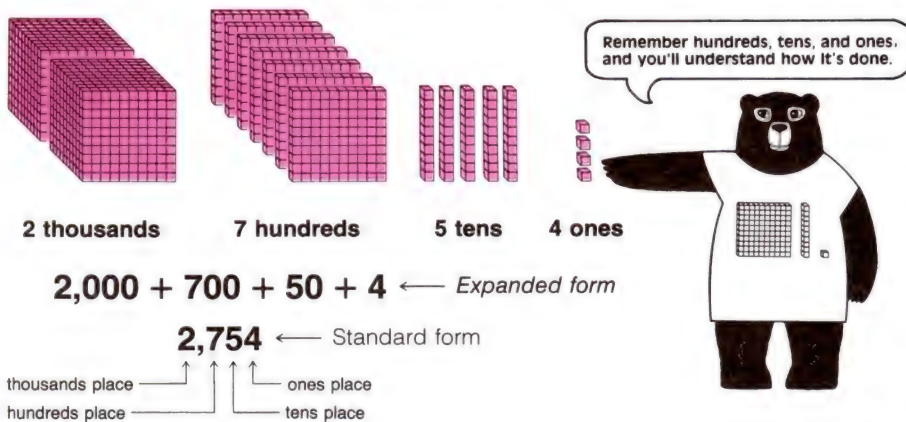
**Practice** Remind students to use a comma between the thousands number and the hundreds number. Explain that the comma separates the digits into groups of three and makes reading the number easier.

**Apply Problem Solving** Read the problems aloud if students are having difficulty.

**Calculator** Students need to work backward to solve Problem 37.

## Thousands

The population of Bayview is two thousand, seven hundred fifty-four.



**Try** Write each number in standard form.

- $9,000 + 200 + 60$   
**9,260**
- $3,000 + 40 + 8$   
**3,048**
- one thousand, four hundred  
**1,400**
- Write 7,123 in words.  
**seven thousand, one hundred twenty-three**
- Write 2,507 in expanded form.  
 **$2,000 + 500 + 7$**

**Practice** Write each number in standard form.

- $9,000 + 700 + 20 + 5$   
**9,725**
- $6,000 + 400 + 30 + 9$   
**6,439**
- $5,000 + 20 + 8$   
**5,028**
- $3,000 + 800 + 90$   
**3,890**
- $2,000 + 600 + 5$   
**2,605**
- $8,000 + 300$   
**8,300**
- three thousand, seven hundred eighty-five  
**3,785**
- four thousand, three hundred sixty-two  
**4,362**
- one thousand, six hundred ten  
**1,610**
- six thousand, two hundred twelve  
**6,212**
- seven thousand, one hundred six  
**7,106**
- five thousand, forty-nine  
**5,049**
- one thousand, ninety-eight  
**1,098**
- eight thousand, five  
**8,005**

28

## Practice 11

Write what digit is in the given place.

1. 3,417 (hundreds) <u>4</u>	2. 5,908 (tens) <u>0</u>
3. 7,051 (thousands) <u>7</u>	4. 8,356 (ones) <u>6</u>
5. 4,123 (thousands) <u>4</u>	6. 7,923 (hundreds) <u>9</u>

Complete the cross-number puzzle by writing the standard form for each number.

Across	Down
7. three thousand, one hundred fifty-nine	7. $3,000 + 700 + 60 + 8$
9. two thousand, four hundred five	9. five thousand, two hundred sixty-one
12. fifty	9. two thousand, five hundred two
13. $600 + 70 + 6$	10. four thousand, forty-one
15. five hundred four	11. five thousand, four hundred thirty-two
16. $8,000 + 300 + 10 + 8$	14. $70 + 3$
17. two thousand, one hundred twenty-two	

## Reteaching 11

Write the standard form.

One thousand, five hundred forty-six

Write the standard form.

1.	2.
<b>2,118</b>	<b>1,329</b>

3. 8 thousands	5 hundreds	7 tens	2 ones	<b>8,572</b>
4. 8 hundreds	4 thousands	9 ones	3 tens	<b>4,839</b>
5. 6 hundreds	7 tens	1 thousand	5 ones	<b>1,675</b>

6. Shade in each box that has a 5 in the tens place. Then shade in each box with a 7 in the thousands place.

7,025	6,170	2,050	5,071	259	7,002	7,974
4,051	532	7,056	647	6,519	854	792
7,071	2,757	7,742	9,025	9,077	6,754	708
9,954	6,077	5,058	3,734	535	456	2,987
7,914	247	7,087	2,511	7,200	8,050	3,055



27.  $600 + 80 + 5$       28.  $400 + 10 + 2$       29.  $7,000 + 800 + 10 + 3$   
 30.  $1,000 + 900 + 80 + 6$       31.  $5,000 + 40 + 2$       32.  $6,000 + 100 + 7$

For each number, tell what digit is in the given place.

15. 6,812 (hundreds)      16. 4,319 (ones)      17. 6,401 (thousands)  
     8                      9                      6  
 18. 3,528 (tens)      19. 7,395 (thousands)      20. 1,076 (hundreds)  
     2                      7                      0

Write each number in words. **See margin.**

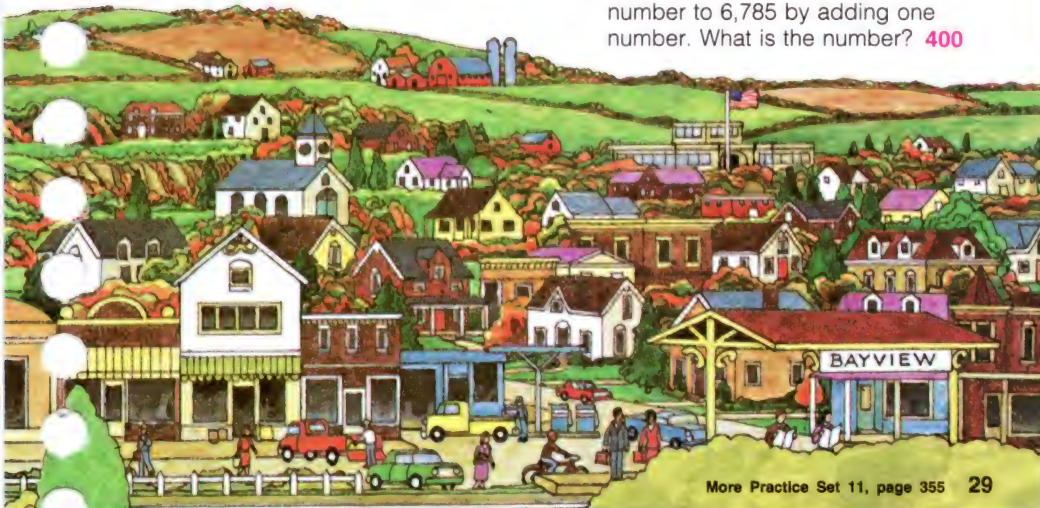
21. 530      22. 304      23. 267      24. 1,000      25. 9,250      26. 8,751

Write each number in expanded form. **See above.**

27. 685      28. 412      29. 7,813      30. 1,986      31. 5,042      32. 6,107

**Apply** Solve each problem.

33. The population of Redfield is three thousand, two hundred forty-seven. Write this number in standard form.  
**3,247**
35. The population of Clifton is two thousand, eighty-one. Write this number in standard form.  
**2,081**
34. Redfield is 15 miles from Bayview. Clifton is 8 miles closer to Bayview. How far is Clifton from Bayview?  
**7 miles**
36. The population of Myerville is the greatest four-digit number possible using all the digits 3, 4, 9, and 1. What is the population of Myerville?  
**9,431 people**
37. **Calculator** Enter the number 6,385 on your calculator. Change the number to 6,785 by adding one number. What is the number? **400**



More Practice Set 11, page 355 29

## Assignment Guide

basic	1–20, 21–33 odd, 37
average	1–35, 37
enriched	1–37

**More Practice Set 11,**  
**page 355**

## Follow-Up

**Extra Practice** Have students write three-digit and four-digit numbers such as the school room number, the year they were born, the current year, and the number of days in a year. Using these numbers, have students write them in words, in standard form, and in expanded form. Have number words posted in the classroom to avoid incorrect spelling.

**Enrichment** Have students write sentences using the numbers they have written in words for Exercises 21–26. For example, for Exercise 21, "Five hundred thirty people attended the school play."

## Computer Assisted Instruction

Mathematics Courseware Series

- Numeration 2, Activity 1

## Enrichment 11

Name \_\_\_\_\_ E11

**A Comparison Game**

Juan and Mary Lynn played a "Greatest Number" game using a deck of cards like these. After mixing the cards, each of them drew 4 cards and used them to show the greatest possible 4-digit number. The one with the greater number scored a point. The winner was the first one to score 10 points.

For the first 5 rounds, they drew the cards shown below. Show how you would arrange them to get the greatest number. Circle the winning combination for each round.

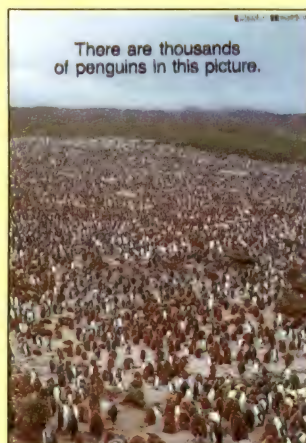
Round	Juan	Best Arrangement	Mary Lynn	Best Arrangement
1.	5 3 7 8		6 2 7 4	
2.	4 7 9 4	9 7 4 4	2 5 3 8	8 5 3 2
3.	8 0 2 6	8 6 2 0	1 2 9 7	9 7 2 1
4.	2 7 0 8	8 7 2 0	1 3 9 6	9 6 3 1
5.	3 4 4 6	6 4 4 3	2 6 3 4	6 4 3 2

Another "Greatest Number" game uses the same cards but is scored differently. On each round, the lesser number is subtracted from the greater number. That difference is the number of points won.

6. If they had kept score in this way, how many points would Juan have won in the first round? **1,111**

7. What would the score be after 3 rounds? **J: 2,323 ML: 1,101**

## Additional Resource 11



### Math Poster E Thousands

Use this poster as a teaching display to give students a feeling for the meaning of large numbers. See Answer Key for teaching ideas.

## Daily Maintenance

Use digits to write each number.

- sixteen [16]
- seventy-three [73]
- twelve [12]
- thirty-five [35]
- forty [40]
- eighty-six [86]

### Answers, page 29

- five hundred thirty
- three hundred four
- two hundred sixty-seven
- one thousand
- nine thousand, two hundred fifty
- eight thousand, seven hundred fifty-one



Objective 12
Compare numbers less than 10,000.

Lesson Theme
Technology: Bridges

- Materials
• Hundreds, Tens, Units (Punchouts or Math Kit)
• Number Lines (Teaching Aid A)

Introduction
Using Concrete Materials Have students work in groups to share hundred squares, ten-sticks, and unit squares. Ask each group to display 259 and 371. Ask students which number is greater. [371] Encourage students to compare hundreds first. The three-digit number with more hundreds is greater. Repeat using other pairs of numbers that will require students to compare tens or ones.

Using the Pages
Teach Be sure students understand that when they compare numbers they must always be comparing digits of the same place value, and they must begin with the largest place value. In Example B, the thousands digit is the same, so it is the hundreds digit that determines the order of the two numbers. Point out that the first place value (from the left) where the numbers differ is what determines whether one number is greater than or less than the other.

Try Error Analysis Watch for students who are confused about the correct way to use the symbols. Remind these students that < and > always point to the lesser number. (See Reteaching 12.)

Apply Problem Solving Ask students which bridge is longest [Ambassador] and which is shortest [Brooklyn]. Explain that the bridges are actual bridges in the United States. The following list identifies the bridges and their corresponding locations.
Ambassador: Michigan
Bear Mountain: New York
Benjamin Franklin: Pennsylvania
Brooklyn: New York
Williamsburg: New York
Write a problem Have students write a problem comparing two bridges that have not been compared. [Brooklyn and Bear Mountain, Bear Mountain and Ambassador, Benjamin Franklin and Williamsburg, Benjamin Franklin and Brooklyn, Ambassador and Brooklyn, Williamsburg and Ambassador]

Comparing Numbers

- A. The table shows the lengths of two floating bridges in the state of Washington. Which is longer, Evergreen Point Bridge or Hood Canal Bridge?

Table with 2 columns: Floating bridge, Length of main span in feet. Rows: Evergreen Point (7,518), Hood Canal (6,471).

Compare 7,518 and 6,471.

7,518 > 6,471 Compare the thousands digits. 7 is greater than 6.

7,518 > 6,471 7,518 is greater than 6,471.

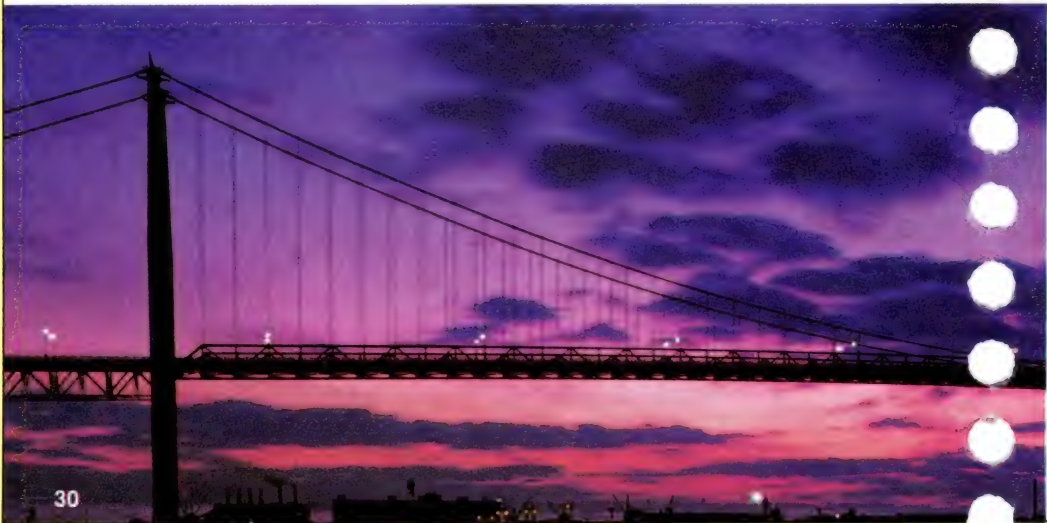
Evergreen Point Bridge is longer than Hood Canal Bridge.

- B. Compare 2,390 and 2,587.

2,390 < 2,587 The thousands digits are the same.

2,390 < 2,587 Compare the hundreds digits. 3 is less than 5.

2,390 < 2,587 2,390 is less than 2,587.



Practice 12

Practice 12 worksheet containing comparison exercises, a table of distances from Milwaukee, and a car illustration.

Reteaching 12

Reteaching 12 worksheet containing comparison exercises, a penguin illustration, and a tip about using comparison symbols.



**Try** Compare the numbers. Use < or >.

- a. 273  $\bullet$  292  $\lt$       b. 5,964  $\bullet$  5,962  $\gt$       c. 7,846  $\bullet$  7,839  $\gt$

**Practice** Compare the numbers. Use < or >.

1. 782  $\bullet$  389  $\gt$       2. 517  $\bullet$  611  $\lt$       3. 587  $\bullet$  593  $\lt$   
 4. 235  $\bullet$  229  $\gt$       5. 8,207  $\bullet$  7,065  $\gt$       6. 1,972  $\bullet$  2,875  $\lt$   
 7. 1,638  $\bullet$  1,730  $\lt$       8. 9,136  $\bullet$  9,218  $\lt$       9. 372  $\bullet$  370  $\gt$   
 10. 415  $\bullet$  417  $\lt$       11. 1,675  $\bullet$  1,658  $\gt$       12. 3,964  $\bullet$  3,961  $\gt$

**Apply** For each problem, tell which bridge is longer. Use the information in the table.

13. Benjamin Franklin or Ambassador  
**Ambassador**  
 14. Williamsburg or Bear Mountain  
**Bear Mountain**  
 15. Benjamin Franklin or Bear Mountain  
**Benjamin Franklin**  
 16. Williamsburg or Brooklyn  
**Williamsburg**

Suspension bridge	Length of main span in feet
Benjamin Franklin	1,750
Williamsburg	1,600
Bear Mountain	1,632
Ambassador	1,850
Brooklyn	1,595

## Assignment Guide

basic	1-16
average	1-16
enriched	1-16

**More Practice Set 12,**  
page 356

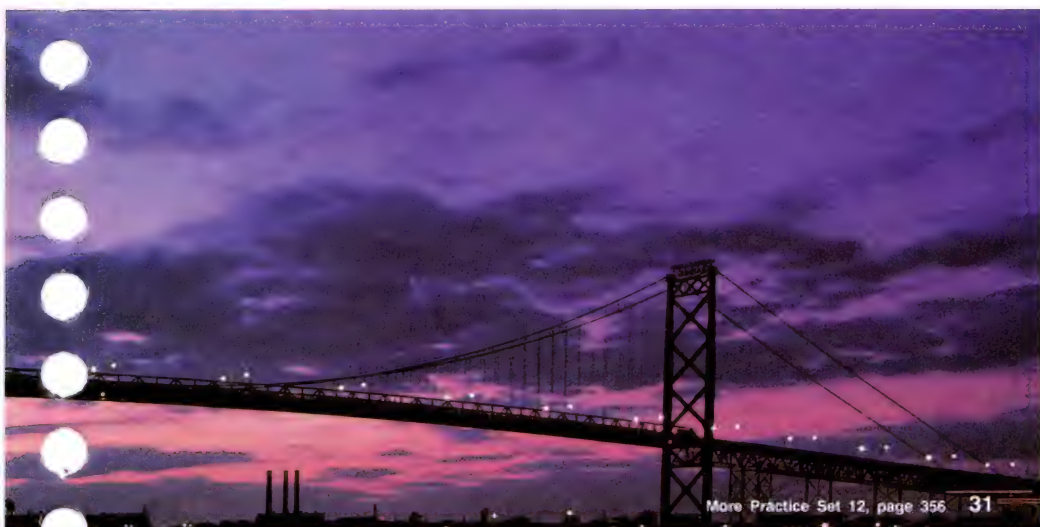
## Follow-Up

**Extra Practice** Have each student write a four-digit number on a piece of paper. Have a student show his or her number. Then ask students having a larger number to raise their hands. Make spot checks to verify answers. Repeat with another student and ask for smaller numbers.

**Reteaching** Write several four-digit numbers on the board. Have students write larger or smaller numbers by changing the digit for a specified place value. For example, have students write a number greater than 3,184 by changing the digit in the tens place [3,194] or have students write a number less than 3,184 by changing a digit in the thousands place. [2,184 or 1,184]

**Enrichment Use data from outside the text** Have students compare numbers showing the heights of buildings, the lengths of railroad tracks, the distance between places, or the weights of objects.

**Computer Assisted Instruction**  
Mathematics Courseware Series  
• Numeration 2, Activity 2a



## Enrichment 12

Name \_\_\_\_\_ E12

**Plan a Trip**

This table gives distances in kilometers between some cities.

	Boston	Chicago	Dallas	Denver	Miami	Omaha	San Diego	Seattle
Atlanta	1,522	975	1,160	1,944	958	1,321	3,043	3,510
Boston		1,395	2,512	2,844	2,025	2,063	4,165	4,017
Chicago			1,291	1,450	1,926	569	2,773	2,768
Dallas				1,038	1,804	838	1,885	2,672
Denver					2,762	781	1,352	1,640
Miami						2,242	3,648	4,384
Omaha							2,113	2,200
San Diego								1,690

To find the distance between cities, follow the rows for each city until they meet.

The distance between Dallas and Omaha is shaded.

1. What is the distance from Dallas to Miami? **1,804 km**

2. What is the distance from Denver to Boston? **2,844 km**

3. What is the distance from Chicago to Omaha? **669 km**

4. Is San Diego nearer to Dallas or to Chicago? **Dallas**

Use < or > to compare distances.

5. Miami  $\lt$  Atlanta to Chicago

6. Seattle  $\gt$  Miami to Denver

7. Boston to Dallas  $\gt$  Omaha to Miami

8. Boston to San Diego  $\gt$  Atlanta to Seattle

9. If you start in Omaha, and visit Chicago, Miami, and Boston before returning home, in what order should you visit the cities to make the trip as short as possible?

Omaha to **Chicago**  
 then to **Boston**  
 then to **Miami**  
 and back to Omaha.

## Additional Resource 12

Name \_\_\_\_\_ Additional Resource 12

**Computer BASIC: Print Statements**

Many keys on your keyboard have two symbols on them. Turn on your computer. Find four of these special keys. Press each key and write the output.

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

Hold down a shift key and press each special key again. Write the output.

5. \_\_\_\_\_ 6. \_\_\_\_\_ 7. \_\_\_\_\_ 8. \_\_\_\_\_

BASIC has many instructions for you to give to the computer. The computer does what you tell it to do after you press RETURN or ENTER.

One BASIC instruction is PRINT. PRINT tells the computer to copy letters and words that you type between quotation marks. Find out how to type quotation marks.

Turn on your computer. Type the following PRINT statements. Press RETURN or ENTER. Write the computer's output.

9. PRINT "MY COMPUTER OBEYS."

10. PRINT "IT FOLLOWS COMMANDS."

11. PRINT "(Your Name)"

12. PRINT "02"

13. PRINT "02 > 308"

Do not use quotation marks in PRINT statements to copy numbers.

MY COMPUTER OBEYS.  
 IT FOLLOWS COMMANDS.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 02  
 02 > 308

## Daily Maintenance

Write these numbers in order from least to greatest.

1. 9 14 3 [3, 9, 14]  
 2. 16 7 13 [7, 13, 16]  
 3. 25 8 5 [5, 8, 25]  
 4. 90 63 82 71 [63, 71, 82, 90]  
 5. 36 74 48 51 [36, 48, 51, 74]  
 6. 86 83 77 92 [77, 83, 86, 92]



## Objective 13

Order numbers and give a number that is 10, 100, or 1,000 greater than a given number.

### Lesson Theme

Technology: Bridges

### Materials

- Number Lines (Teaching Aid A)
- Cards (1 set, 0–9)
- Classroom Objects

## Introduction

**Using Concrete Materials** Using the digit cards, have each of 4 students choose one card and arrange themselves in front of the class to show the greatest four-digit number they can. Write the number on the board. Have the rest of the class explain how they know it is the greatest number possible. Have the students with the cards show the least four-digit number they can. Write the number on the board. Have other students explain how they know that it is the least. Finally, ask them to show a number between those two. Write the number on the board. Repeat the activity using different cards until each student has had a chance to participate.

Ask students to give some examples where they might compare two numbers in everyday life. [Distance, height, weight] Extend this to include three numbers, such as 5, 8, and 3, and explain that these numbers may be ordered from greatest to least or least to greatest. Review how comparing is used to order.

## Using the Pages

**Teach** Read and discuss the examples. To see if students understand Example B, have them extend each list by at least three numbers.

**Try Error Analysis** Watch for students who order the numbers in Exercise a from least to greatest. Remind these students to read the directions carefully. In Exercise b, have students find a number that is 100 greater [697] and 1,000 greater [1,597] than 597. (See Reteaching 13.)

**Practice** Remind students to read the directions for Exercises 1–10 and Exercises 11–20 carefully.

## Ordering Numbers

The four longest suspension bridges in North America are listed in this table.

Bridge	Location	Length of main span in feet
George Washington	New York	3,500
Golden Gate	California	4,200
Mackinac	Michigan	3,800
Verrazano-Narrows	New York	4,260

- A. List the lengths in order from least to greatest.

First, write the thousands digits in order. Complete each number as soon as you know its order.

3	The thousands digits are the same. Write the hundreds digits in order.	35	Complete each number.	3,500
3		38		3,800
4	The thousands digits are the same. The hundreds digits are the same.	42	Write the tens digits in order. Complete each number.	4,200
4		42		4,260

The lengths in order from least to greatest are 3,500 feet, 3,800 feet, 4,200 feet, and 4,260 feet.

- B. Study the patterns. Think of counting by thousands, by hundreds, and by tens.

467	742	976
1,467	842	986
2,467	942	996
3,467	1,042	1,006
4,467	1,142	1,016
5,467	1,242	1,026
Each number is 1,000 greater than the number before it.	Each number is 100 greater than the number before it.	Each number is 10 greater than the number before it.

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## Practice 13

Name \_\_\_\_\_ P13

Write the numbers in order from least to greatest.

1. 671 617 284	284 617 671
2. 1,576 5,879 8,752	1,576 5,879 8,752
3. 6,324 4,777 7,444	4,777 6,324 7,444
4. 90 909 990 9,900	90 909 990 9,900
5. 329 246 854	246 329 854

Write the numbers in order from greatest to least.

6. 786 556 848	848 786 556
7. 8,809 4,673 2,522	8,809 4,673 2,522
8. 2,508 2,656 1,999	2,656 2,508 1,999
9. 59 509 590 5,900	5,900 590 509 59
10. 782 1,570 106	1,570 782 106

Write the number that is 1,000 greater.

11. 4,865	5,865	12. 1,909	2,909	13. 921	1,921
-----------	-------	-----------	-------	---------	-------

Write the number that is 100 greater.

14. 843	943	15. 109	209	16. 8,007	8,107
---------	-----	---------	-----	-----------	-------

Write the number that is 10 greater.

17. 67	77	18. 509	519	19. 6,238	6,248
--------	----	---------	-----	-----------	-------

## Reteaching 13

Name \_\_\_\_\_ R13

A. Write these numbers in order from the least to the greatest: 16 29 21

Order the tens:

1	2	2
---	---	---

Then order the ones:

16	21	29
----	----	----

16 21 29

B. Write these numbers in order from the least to the greatest: 728 721 749

The hundreds are the same. Order the tens:

72	72	74
----	----	----

Then order the ones:

721	728	749
-----	-----	-----

721 728 749

What kind of bows don't go on presents?

In each exercise, write the numbers in order. Begin with the least number. Copy the letters in the blanks below.

1. 35 47 31	2. 43 41 49
I	B
3. 141 127 248	4. 241 251 243
S	W
5. 490 409 498	6. 492 491 489
N	O
7. 531 513 537	8. 616 666 606
R	A
R A N B O W S	
513 666 35 490 49 492 243 127	



## Assignment Guide

basic	1–35, odd, 36
average	1–20, 21–36 even, 37
enriched	1–37

**More Practice Set 13,**  
page 356

## Follow-Up

**Extra Practice** Reverse the directions for Exercises 1–10 and 11–20 and have students do the exercises using the new directions.

**Reteaching** Give students several number lines. Have them locate a number such as 28 on the number line and then find a number that is 10 greater or 10 less. Next have students order numbers such as 24, 28, and 22 on the number line.

**Enrichment** Prepare a set of cards with various two-, three-, and four-digit numbers on them. Divide the students into two teams. Show each student a card. The student gives the number that is 10 greater than the number shown to score one point, 100 greater for two points, and 1,000 greater for three points. The team with the most points wins.

## Cooperative Learning Groups

See page 475 of this Teacher's Edition.

## Try

- a. Write 1,568, 1,572, and 1,621 in order from greatest to least.  
**1,621 1,572 1,568**
- b. Give the number that is 10 greater than 597.  
**607**

**Practice** Write the numbers in order from least to greatest.

- |  |   |  |
|--|---|--|
| 1. 162 357 283<br><b>162 283 357</b>                         | 2. 423 315 248<br><b>248 315 423</b>                          | 3. 546 637 532<br><b>532 546 637</b>             |
| 4. 768 854 835<br><b>768 835 854</b>                         | 5. 1,384 2,925 1,274<br><b>1,274 1,384 2,925</b>              | 6. 1,354 1,267 1,282<br><b>1,267 1,282 1,354</b> |
| 7. 256 249 273 268<br><b>249 256 268 273</b>                 | 8. 716 724 705 734<br><b>705 716 724 734</b>                  |  |
| 9. 1,405 1,487 1,326 1,314<br><b>1,314 1,326 1,405 1,487</b> | 10. 3,657 3,472 3,470 3,381<br><b>3,381 3,470 3,472 3,657</b> |  |

Write the numbers in order from greatest to least.

- |   |   |   |
|---|---|---|
| 11. 781 693 892<br><b>892 781 693</b>                         | 12. 189 341 256<br><b>341 256 189</b>                         | 13. 458 315 409<br><b>458 409 315</b>             |
| 14. 627 683 725<br><b>725 683 627</b>                         | 15. 7,689 7,456 8,122<br><b>8,122 7,689 7,456</b>             | 16. 3,984 4,923 3,856<br><b>4,923 3,984 3,856</b> |
| 17. 576 595 583 568<br><b>595 583 576 568</b>                 | 18. 266 284 220 244<br><b>284 266 244 220</b>                 |   |
| 19. 1,476 1,412 1,502 1,320<br><b>1,502 1,476 1,412 1,320</b> | 20. 8,655 8,740 8,622 8,625<br><b>8,740 8,655 8,625 8,622</b> |   |

Write the number that is 1,000 greater.

- |                           |                           |                           |                           |                         |
|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|
| 21. 4,582<br><b>5,582</b> | 22. 2,702<br><b>3,702</b> | 23. 1,936<br><b>2,936</b> | 24. 8,029<br><b>9,029</b> | 25. 980<br><b>1,980</b> |
|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------|

Write the number that is 100 greater.

- |                       |                       |                           |                           |                         |
|-----------------------|-----------------------|---------------------------|---------------------------|-------------------------|
| 26. 640<br><b>740</b> | 27. 113<br><b>213</b> | 28. 1,898<br><b>1,998</b> | 29. 2,480<br><b>2,580</b> | 30. 964<br><b>1,064</b> |
|-----------------------|-----------------------|---------------------------|---------------------------|-------------------------|

Write the number that is 10 greater.

- |                       |                       |                           |                           |                           |
|-----------------------|-----------------------|---------------------------|---------------------------|---------------------------|
| 31. 750<br><b>760</b> | 32. 210<br><b>220</b> | 33. 4,209<br><b>4,219</b> | 34. 6,206<br><b>6,216</b> | 35. 1,893<br><b>1,903</b> |
|-----------------------|-----------------------|---------------------------|---------------------------|---------------------------|

**Apply** Solve each problem.

36. The Quebec Bridge is 1,800 feet long. The Tacoma-Narrows Bridge is 1,000 feet longer. How long is the Tacoma-Narrows Bridge?  
**2,800 feet**
37. **Write a problem.** Write a problem comparing the lengths of two bridges. Solve the problem.  
**Answers will vary.**

Using Problem-Solving Strategies, page 412  
More Practice Set 13, page 356 **33**

## Enrichment 13

**Do Not Repeat!** E13

We can use the digits 1, 4, and 9 to make 2-digit or 3-digit numbers without repeating a digit in a number.

2-digit numbers: 14 19 41 49 91 94

3-digit numbers: 149 194 419 491 914 941

Use the digits 4, 7, and 8 to write as many numbers as you can. Do not repeat a digit in a number. Write the numbers in order from least to greatest.

1. 2-digit numbers **47 48 74 78 84 87**

2. 3-digit numbers **478 487 748 784 847 874**

3. Write as many 4-digit numbers as you can using 2, 5, 6, and 8. Do not repeat a digit in a number. Write the numbers in order.

<b>5,268</b>	<b>6,258</b>	<b>8,256</b>
<b>5,286</b>	<b>6,285</b>	<b>8,265</b>
<b>5,628</b>	<b>6,528</b>	<b>8,526</b>
<b>2,685</b>	<b>5,682</b>	<b>6,582</b>
<b>2,856</b>	<b>5,826</b>	<b>6,825</b>
<b>2,865</b>	<b>5,862</b>	<b>6,852</b>

If you use the digits 1 through 9, what is the least number you can write using

4. 3 different digits **123**      5. 7 different digits **1,234,567**

## Additional Resource 13

**Additional Resource 13**

**Computer BASIC Programs**

A statement gives the computer one instruction to follow. A **program** is a set of numbered instructions for the computer.

After you type **RUN**, the computer reads the statements in a program one at a time and performs them immediately.

The computer will not do your program until you type the command **RUN**. **RUN** tells the computer to read your program and follow your instructions.

Turn on your computer. Type the following instructions. Press **RETURN** or **ENTER** after each line.

1. 10 PRINT "PROGRAM INSTRUCTIONS"  
20 PRINT "ARE NUMBERED"  
30 END

Type the command **LIST** and press **RETURN** or **ENTER**. **LIST** tells the computer to print your program on the screen. Write the output.

10 PRINT "PROGRAM INSTRUCTIONS"  
20 PRINT "ARE NUMBERED"  
30 END

2. Type **RUN**. Write the output.

3. Type the program below. Type **RUN**. Write the output.

10 PRINT 5680  
20 PRINT 1937  
30 PRINT 2046  
40 END

5680  
1937  
2046

Each line in your program has a number. The computer reads your program in order.

The word **END**, which every program has, tells the computer that it has reached the end of your program.

## Daily Maintenance

Tell what each 5 means.

- 3,596 [5 hundreds]
- 405 [5 ones]
- 5,981 [5 thousands]
- 52,006 [5 ten-thousands]
- 39,452 [5 tens]

**Using Problem-Solving Strategies, page 412**



**Objective 14** (Target Objective)  
Round a number to the nearest ten or nearest hundred.

**Lesson Theme**  
Recreation: Travel

**Vocabulary**  
Rounded numbers

**Materials**

- Number Lines (Teaching Aid A)
- Newspaper or magazines
- Road maps

## Introduction

**Warm-Up Review** Have students count by tens to 200. Write each multiple of ten on a number line. Then ask students to tell between which two multiples of ten a given number would be found. For example, "Between which two multiples of ten is 138?" [130 and 140]. Repeat this activity using multiples of 100 to 2,000. Have students suggest numbers for the class to locate. As the activity progresses have students name the multiple that is nearer to the named number. [138 is between 130 and 140, but nearer to 140.]

Explain to students that we often use rounded numbers, or numbers expressed to the nearest ten, hundred, thousand, and so on. For example, we say, "It's about 60 miles to Toledo," "That cost about \$400," or "About 20 students went on a picnic," when the actual numbers might be 57 miles, \$398, or 16 students. Ask students for other examples of rounding numbers.

## Using the Pages

**Teach** Stress that there are three rounding situations: rounding up to the closest number, rounding down to the closest number, and rounding up when the number is halfway between. Use the number lines and have students round the following numbers first to the nearest ten and then to the nearest hundred: 222 [220, 200], 723 [720, 700], 178 [180, 200], 889 [890, 900], 451 [450, 500], 645 [650, 600], 595 [600, 600].

**Try** Point out that in Exercise b rounding to the nearest ten changes the hundreds digit as well.

**Practice** The answers to the starred exercises are numbers that have one digit more than those given.

## Rounding: Nearest Ten and Nearest Hundred



The Jensen family went on a bus tour. There were 47 people on the bus. They traveled 329 miles the first day. The Jensens spent \$450 on the tour. When Mr. Jensen wrote these facts in his diary, he used *rounded numbers*.

- A.** Round 47 to the nearest ten.  
Use this number line.



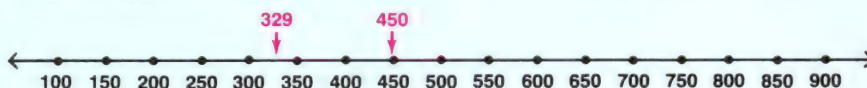
47 is between 40 and 50, but it is closer to 50.

Round 47 up to 50.

- B.** Round 329 to the nearest hundred.  
Use the number line below.

329 is between 300 and 400, but it is closer to 300.

Round 329 down to 300.



- C.** Round 450 to the nearest hundred.  
Use the number line below.

450 is exactly halfway between 400 and 500.

Round 450 up to 500.

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## Practice 14

Round each number to the nearest ten.

1. 42 <u>40</u>	2. 63 <u>60</u>	3. 87 <u>90</u>	4. 19 <u>20</u>
5. 49 <u>50</u>	6. 416 <u>420</u>	7. 981 <u>980</u>	8. 24 <u>20</u>

Round each number to the nearest hundred.

9. 875 <u>900</u>	10. 748 <u>700</u>	11. 555 <u>600</u>	12. 122 <u>100</u>
13. 306 <u>300</u>	14. 665 <u>700</u>	15. 438 <u>400</u>	16. 305 <u>300</u>

Round each number to the nearest hundred.  
Match each answer with its letter in the code table. Then write the letters in the same order as the exercises are numbered. You will find a message.

17. 526 <u>500</u>	18. 695 <u>700</u>	19. 318 <u>300</u>
20. 268 <u>300</u>	21. 590 <u>600</u>	22. 298 <u>300</u>
23. 432 <u>400</u>	24. 876 <u>900</u>	25. 62 <u>100</u>
26. 770 <u>800</u>	27. 1,003 <u>1,000</u>	28. 710 <u>700</u>
29. 340 <u>300</u>	30. 249 <u>200</u>	31. 108 <u>100</u>

100	200	300	400	500	600	700	800	900	1,000
Y	L	E	R	U	N	S	W	G	I

**S E   E N E R G Y   W I S E L Y**

## Reteaching 14

Round 48 to the nearest 10.

If your number is halfway or more round up.

48 is between 45 and 50.  
48 is nearer to 50.  
48 rounds up to 50.

Use the number line to round each number to the nearest 10.

1. 65 <u>70</u>	2. 42 <u>40</u>	3. 28 <u>30</u>
4. 87 <u>90</u>	5. 19 <u>20</u>	6. 12 <u>10</u>
7. 21 <u>20</u>	8. 38 <u>40</u>	9. 46 <u>50</u>
10. 59 <u>60</u>	11. 75 <u>80</u>	12. 68 <u>70</u>

Round 432 to the nearest 100.

432 is between 400 and 500.  
432 is nearer to 400.  
432 rounds down to 400.

Round each number to the nearest 100.

13. 850 <u>900</u>	14. 127 <u>100</u>	15. 317 <u>300</u>
16. 489 <u>500</u>	17. 550 <u>600</u>	18. 291 <u>300</u>
19. 511 <u>500</u>	20. 777 <u>800</u>	21. 651 <u>700</u>
22. 939 <u>900</u>	23. 848 <u>800</u>	24. 478 <u>500</u>





# Assignment Guide

basic	1–11, 13–23
average	1–11, 13–23
enriched	1–24

More Practice Set 14,  
page 356

## Maintenance, page 35

**Mental Math** Encourage students to do these exercises mentally. Remind students to use the basic-fact strategies that they learned in Chapter 1, to help them with any facts that they cannot remember.

## Follow-Up

**Extra Practice** Have students round to the nearest ten their age, their weight, their height (total inches), and the number of students in the classroom.

**Reteaching** Have students reverse the digits in Exercises 1–11. Let students use number lines to help them round these numbers to the nearest ten. 47 [50], 29 [30], 58 [60], 63 [60], 81 [80], 21 [20], 34 [30], 52 [50], 234 [230], 708 [710], 793 [790].

## Enrichment Using Concrete Materials

Have students bring to school road maps that show distances in miles between cities. Ask students to plan a driving-trip route of 200 miles by rounding distances between cities to the nearest ten.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Numeration 2, Activities 3a, 6

**Try** Round each number to the nearest ten.

a. 33 <b>30</b>	b. 695 <b>700</b>	c. 942 <b>940</b>	d. 508 <b>510</b>
--------------------	----------------------	----------------------	----------------------

Round each number to the nearest hundred.

e. 640 <b>600</b>	f. 250 <b>300</b>	g. 391 <b>400</b>	h. 817 <b>800</b>
----------------------	----------------------	----------------------	----------------------

**Practice** Round each number to the nearest ten.

1. 74 <b>70</b>	2. 92 <b>90</b>	3. 85 <b>90</b>	4. 36 <b>40</b>
5. 18 <b>20</b>	6. 12 <b>10</b>	7. 43 <b>40</b>	8. 25 <b>30</b>
9. 432 <b>430</b>	10. 807 <b>810</b>	11. 397 <b>400</b>	*12. 98 <b>100</b>

Round each number to the nearest hundred.

13. 378 <b>400</b>	14. 542 <b>500</b>	15. 439 <b>400</b>	16. 267 <b>300</b>
17. 150 <b>200</b>	18. 846 <b>800</b>	19. 235 <b>200</b>	20. 750 <b>800</b>
21. 654 <b>700</b>	22. 109 <b>100</b>	23. 504 <b>500</b>	*24. 987 <b>1,000</b>

## MAINTENANCE

Add or subtract.

1. 15 – 7 <b>8</b>	2. 8 + 3 <b>11</b>
3. 9 + 5 <b>14</b>	4. 13 – 6 <b>7</b>
5. 8 + 4 <b>12</b>	6. 5 + 5 <b>10</b>
7. 17 – 9 <b>8</b>	8. 6 + 3 <b>9</b>
9. 14 – 6 <b>8</b>	10. 15 – 9 <b>6</b>
11. 9 + 7 <b>16</b>	12. 11 – 4 <b>7</b>
13. 12 – 5 <b>7</b>	14. 9 + 9 <b>18</b>
15. 13 – 9 <b>4</b>	16. 12 – 3 <b>9</b>
17. 7 + 7 <b>14</b>	18. 5 + 8 <b>13</b>
19. 8 + 9 <b>17</b>	20. 11 – 7 <b>4</b>

More Practice Set 14, page 356 **35**

## Enrichment 14

Name \_\_\_\_\_ E14

**How Many Years Ago?**

Many things we use today were invented in the 1800s. Write the name of each invention and the year it was invented on the lines below.

1849 Safety pin	1867 Typewriter	1826 Photograph
1816 Stethoscope	1893 Zipper	1844 Safety match
1877 Phonograph	1839 Bicycle	1884 Skyscraper

Round each year to the nearest ten.

10. <b>1820</b>	11. <b>1830</b>	12. <b>1840</b>
13. <b>1840</b>	14. <b>1850</b>	15. <b>1870</b>
16. <b>1880</b>	17. <b>1880</b>	18. <b>1890</b>

Use the rounded dates in Exercises 10–18 to find out about how many years passed between the inventions of

19. the safety pin and the zipper <b>40 years</b>
20. the stethoscope and the skyscraper <b>60 years</b>
21. the phonograph and the zipper <b>10 years</b>

## Additional Resource 14

Name \_\_\_\_\_ Additional Resource 14

Calculator Place Value Words

You can use me to make words.

When the calculator display 10345786 is turned upside down, you see funny forms of the letters gBLShEOI.

Find each answer. Then turn your calculator upside down. Write the word you see.

1. Enter 781 Subtract 2 tens Add 3 hundreds Add 2 hundreds Number <b>7738</b> Word <b>bell</b>	2. Enter 1235 Add 2 thousand Subtract 2 hundred Add 1 ten Number <b>3045</b> Word <b>shoe</b>
3. Enter 8453 Subtract 2 tens Add 3 hundreds Add 5 ones Subtract 1 thousand Number <b>7738</b> Word <b>bell</b>	4. Enter 9158 Subtract 1 one Add 3 hundreds Subtract 6 thousands Add 5 tens Number <b>3507</b> Word <b>lose</b>
5. Enter 1256 Subtract 2 tens Add 6 thousands Subtract 1 one Add 5 hundreds Number <b>7735</b> Word <b>sell</b>	6. Enter 7315 Add 2 hundreds Subtract 1 ten Subtract 2 thousands Add 3 ones Number <b>5508</b> Word <b>boss</b>

## Daily Maintenance

Tell whether you add or subtract. Then find the answer.

- There were 8 turtles in the pond, and 7 turtles on the bank. How many in all? [Add, 15 turtles]
- Tom counted 12 birds. Scott counted 3 fewer birds than Tom. How many birds did Scott count? [Subtract, 9 birds]
- A bear caught 9 fish, but 2 swam away. How many fish were left? [Subtract, 7 fish]



## Objective 15

Round a number to the nearest hundred or nearest thousand.

### Lesson Theme

Social Studies: Population

### Materials

- Number Lines (Teaching Aid A)

## Introduction

**Warm-Up Review** Use the following exercises to review the procedures used for rounding to the nearest ten and nearest hundred.

- 47 nearest ten [50]
- 724 nearest ten [720]
- 351 nearest hundred [400]
- 519 nearest hundred [500]

## Using the Pages

**Teach** Before beginning Example A, see if the students can tell how they would round to the nearest thousand.

Other teaching examples:

- Round 1,572 to the  
nearest ten [1,570]  
nearest hundred [1,600]  
nearest thousand [2,000]

**Try Error Analysis** In Exercise a, watch for students who round to the nearest hundred (3,500) before rounding to the nearest thousand. Remind these students that they round only once for each exercise. Have them use number lines to check their answers.

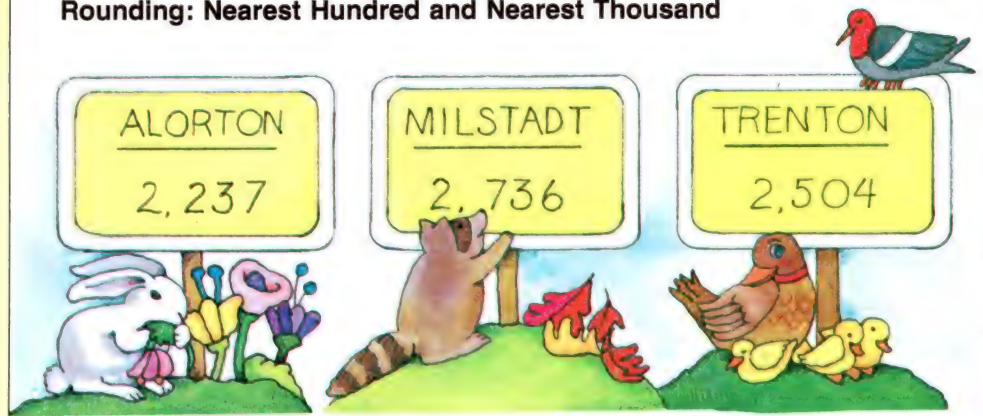
Point out that in Exercise b the procedure for rounding to the nearest hundred changes the thousands digit as well. (See **Reteaching 15**.)

**Apply Problem Solving** Allow students to use materials such as number lines to help in problem solving.

**Use data from a table** In Problems 22 and 23, point out that both numbers round to 7,000, although East Alton is a considerably larger town than Cary.

**Write a problem** Vernon Hills, Illinois, has a population of 9,827. Have students use this data and other data from the table to write a problem.

## Rounding: Nearest Hundred and Nearest Thousand



- A.** Round the number on each sign to the nearest thousand.

In each number, the thousands digit is 2, so each number is between 2,000 and 3,000.

To round to the nearest thousand, look at the hundreds digit.

**2,237**

The hundreds digit is less than 5. The thousands digit stays the same.

**2,000**

**2,736**

The hundreds digit is greater than 5. Add 1 to the thousands digit.  
 $2 + 1 = 3$

**3,000**

**2,504**

The hundreds digit is 5. Add 1 to the thousands digit.  
 $2 + 1 = 3$

**3,000**

- B.** Round 1,637 and 1,650 to the nearest hundred.

Each number is between 1,600 and 1,700.

To round to the nearest hundred, look at the tens digit.

**1,637**

The tens digit is less than 5. Round down.  
**1,600**

**1,650**

The tens digit is 5. Round up.  
**1,700**

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## Practice 15

Complete the table. Round each distance.

Cities	Distance in kilometers	Nearest 100	Nearest 1,000
Richmond to Pueblo	2,781	2,800	3,000
Amarillo to Miami	2,677	2,700	3,000
Seattle to Los Angeles	1,833	1,800	2,000
Chicago to Roswell	2,053	2,100	2,000
Walla Walla to Boston	4,727	4,700	5,000
New York to Boise	4,131	4,100	4,000
Mobile to Fargo	2,270	2,300	2,000

Round each number to the nearest hundred.

1. 394 <u>400</u>	2. 1,631 <u>1,600</u>	3. 9,888 <u>9,900</u>
4. 767 <u>800</u>	5. 8,411 <u>8,400</u>	6. 1,250 <u>1,300</u>

Round each number to the nearest thousand.

7. 5,678 <u>6,000</u>	8. 8,501 <u>9,000</u>	9. 2,099 <u>2,000</u>
10. 7,790 <u>8,000</u>	11. 1,095 <u>1,000</u>	12. 1,400 <u>1,000</u>

Solve each problem.

13. Ty Cobb had 4,191 hits in his baseball career. Round this number to the nearest hundred. <u>4,200 hits</u>	14. Willie Mays scored 2,062 runs in his baseball career. Round this number to the nearest thousand. <u>2,000 runs</u>
---	---

## Reteaching 15

Round each number to the nearest 100.

Touch the digit in the hundreds place. Circle the digit to the right. Is the circled digit 5 or greater?

2,8 <u>6</u> 3 Yes, round up to 2,900.	2,8 <u>4</u> 1 No, round down to 2,800.
---	--

Point to the hundreds place. Circle the digit to the right. Do you round up or down?

1. 3 <u>4</u> 7 <u>Down</u>	2. 815 <u>Down</u>	3. 681 <u>Up</u>
4. 492 <u>Up</u>	5. 246 <u>Down</u>	6. 903 <u>Down</u>
7. 64 <u>7</u> 1 <u>Up</u>	8. 8917 <u>Down</u>	9. 3557 <u>Up</u>

Why was the rocket out of work?

Round each number to the nearest 100. Write the letters in the blanks below.

10. 473 <u>500</u> S	11. 181 <u>200</u> E
12. 313 <u>300</u> D	13. 148 <u>100</u> I
14. 624 <u>600</u> W	15. 777 <u>800</u> R
16. 699 <u>700</u> A	17. 6481 <u>6,500</u> I
18. 7,521 <u>7,500</u> T	19. 8,617 <u>8,600</u> F

**I T W A F I R E D**

100 7,500 600 700 500 8,600 6,500 800 200 300



## Assignment Guide

basic	1–9, 11–19, 21–26
average	1–9, 11–19, 21–26
enriched	1–27

**More Practice Set 15,**  
page 357

## Follow-Up

**Extra Practice** Have students reverse the digits in Exercises 11–19 and round to the nearest hundred. [672, 700; 143, 100; 8,273, 8,300; 9,864, 9,900; 9,052, 9,100; 7,508, 7,500; 3,617, 3,600; 1,205, 1,200; 4,896, 4,900]

**Enrichment** Tell students that three numbers rounded to the nearest thousand are 2,000, 6,000, and 8,000. Ask students to identify the greatest possible sum of the original numbers. [17,497] Then ask them to identify the least possible sum. [14,500]

## Calculator

- If three numbers rounded to the nearest hundred are 500, 400, and 200, what is the greatest possible sum of the original numbers? [1,247] What is the least possible sum? [950]
- If three numbers rounded to the nearest ten are 1,120, 290, and 3,780, what is the greatest possible sum of the original numbers? [5,202] What is the least possible sum? [5,175]
- If three numbers rounded to the nearest thousand are 2,000, 6,000, and 8,000, what is the greatest possible sum of the original numbers? [17,497] What is the least possible sum? [14,500]

## Computer Assisted Instruction

Mathematics Courseware Series

- Numeration 2, Activity 3b

## Try

- Round 3,492 to the nearest thousand.  
**3,000**
- Round 5,973 to the nearest hundred.  
**6,000**

**Practice** Round each number to the nearest thousand.

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. 3,468<br><b>3,000</b> | 2. 6,723<br><b>7,000</b> | 3. 8,144<br><b>8,000</b> | 4. 2,890<br><b>3,000</b> | 5. 3,507<br><b>4,000</b> |
| 6. 6,402<br><b>6,000</b> | 7. 1,076<br><b>1,000</b> | 8. 2,500<br><b>3,000</b> | 9. 7,682<br><b>8,000</b> | 10. 974<br><b>1,000</b>  |

Round each number to the nearest hundred.

- |                           |                           |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 11. 276<br><b>300</b>     | 12. 341<br><b>300</b>     | 13. 3,728<br><b>3,700</b> | 14. 4,689<br><b>4,700</b> | 15. 2,509<br><b>2,500</b> |
| 16. 8,057<br><b>8,100</b> | 17. 7,163<br><b>7,200</b> | 18. 5,021<br><b>5,000</b> | 19. 6,984<br><b>7,000</b> | 20. 89<br><b>100</b>      |

**Apply** Use data from a table. Solve each problem. Round the population of each town to the nearest thousand.

- |                                |                          |                                |
|--------------------------------|--------------------------|--------------------------------|
| 21. Barrington<br><b>9,000</b> | 22. Cary<br><b>7,000</b> | 23. East Alton<br><b>7,000</b> |
|--------------------------------|--------------------------|--------------------------------|

Round the population of each town to the nearest hundred.

- |                              |                           |                                 |
|------------------------------|---------------------------|---------------------------------|
| 24. Rochelle<br><b>9,000</b> | 25. Salem<br><b>7,800</b> | 26. Shelbyville<br><b>5,300</b> |
|------------------------------|---------------------------|---------------------------------|

27. Round the population of Salem to the nearest ten.  
**7,810**

Illinois town	Population
Barrington	9,029
Cary	6,640
East Alton	7,123
Rochelle	8,982
Salem	7,813
Shelbyville	5,259

## Calculator

To answer each question, follow the directions, and turn your calculator upside down.

- What kind of clothes did the giant wear? Enter the number that is 100 less than 1,018.  
**Big**
- What did the giant use boats for? Enter 38,495. Add 14,550.  
**Shoes**

More Practice Set 15, page 357 **37**

## Enrichment 15

**More Magic Squares**

Round each number. Write your answer in the same place in the new square. Your new answers should form a magic square. Find each magic sum.

1. Round to the nearest 10

1,483	1,322	3,197
3,717	1,999	275
804	2,676	2,524

**800**   **2,680**   **2,520**

Magic sum **6,000**

2. Round to the nearest 100

762	4,549	3,720
5,887	2,999	67
2,341	1,450	5,249

**800**   **4,600**   **1,700**

**5,900**   **3,000**   **100**

**2,300**   **1,500**   **5,200**

Magic sum **9,000**

3. Round to the nearest 1,000

2,925	3,486	5,764
7,298	4,300	872
2,359	4,500	5,494

**3,000**   **3,000**   **6,000**

**7,000**   **4,000**   **1,000**

**2,000**   **5,000**   **5,000**

Magic sum **12,000**

In a magic square the sums of all the rows, columns, and diagonals are the same.

## Additional Resource 15

**Maintenance**

Add

1. $\begin{array}{r} 5 \\ + 3 \\ \hline 8 \end{array}$	2. $\begin{array}{r} 7 \\ + 4 \\ \hline 11 \end{array}$	3. $\begin{array}{r} 3 \\ + 3 \\ \hline 6 \end{array}$	4. $\begin{array}{r} 6 \\ + 2 \\ \hline 8 \end{array}$	5. $\begin{array}{r} 9 \\ + 6 \\ \hline 15 \end{array}$
6. $\begin{array}{r} 2 \\ + 1 \\ \hline 3 \end{array}$	7. $\begin{array}{r} 9 \\ + 5 \\ \hline 14 \end{array}$	8. $\begin{array}{r} 0 \\ + 4 \\ \hline 4 \end{array}$	9. $\begin{array}{r} 2 \\ + 2 \\ \hline 4 \end{array}$	10. $\begin{array}{r} 4 \\ + 4 \\ \hline 8 \end{array}$
11. $\begin{array}{r} 7 \\ + 7 \\ \hline 14 \end{array}$	12. $\begin{array}{r} 6 \\ + 5 \\ \hline 11 \end{array}$	13. $\begin{array}{r} 4 \\ + 8 \\ \hline 12 \end{array}$	14. $\begin{array}{r} 9 \\ + 3 \\ \hline 12 \end{array}$	15. $\begin{array}{r} 8 \\ + 4 \\ \hline 12 \end{array}$
16. $\begin{array}{r} 7 \\ + 6 \\ \hline 13 \end{array}$	17. $\begin{array}{r} 6 \\ + 6 \\ \hline 12 \end{array}$	18. $\begin{array}{r} 9 \\ + 4 \\ \hline 13 \end{array}$	19. $\begin{array}{r} 3 \\ + 8 \\ \hline 11 \end{array}$	20. $\begin{array}{r} 7 \\ + 5 \\ \hline 12 \end{array}$
21. $\begin{array}{r} 0 \\ + 0 \\ \hline 0 \end{array}$	22. $\begin{array}{r} 1 \\ + 9 \\ \hline 10 \end{array}$	23. $\begin{array}{r} 7 \\ + 3 \\ \hline 10 \end{array}$	24. $\begin{array}{r} 6 \\ + 4 \\ \hline 10 \end{array}$	25. $\begin{array}{r} 2 \\ + 4 \\ \hline 6 \end{array}$
26. $\begin{array}{r} 8 \\ + 7 \\ \hline 15 \end{array}$	27. $\begin{array}{r} 9 \\ + 9 \\ \hline 18 \end{array}$	28. $\begin{array}{r} 2 \\ + 8 \\ \hline 10 \end{array}$	29. $\begin{array}{r} 7 \\ + 9 \\ \hline 16 \end{array}$	30. $\begin{array}{r} 9 \\ + 8 \\ \hline 17 \end{array}$
31. $\begin{array}{r} 8 \\ + 8 \\ \hline 16 \end{array}$	32. $\begin{array}{r} 7 \\ + 8 \\ \hline 15 \end{array}$	33. $\begin{array}{r} 5 \\ + 5 \\ \hline 10 \end{array}$	34. $\begin{array}{r} 1 \\ + 8 \\ \hline 9 \end{array}$	35. $\begin{array}{r} 3 \\ + 2 \\ \hline 5 \end{array}$

## Daily Maintenance

Tell what the 6 means in each number.

- 65 [6 tens]
- 16 [6 ones]
- 623 [6 hundreds]
- 467 [6 tens]
- 806 [6 ones]
- 619 [6 hundreds]



## Using Problem-Solving Strategies

- Use physical models.
- List all possibilities.
- Find a pattern.

### Materials

- Six cards with each of the numbers from 1 to 6 written on them for each pair of students.

### Introduction

This problem provides students with an opportunity to work with sums of three numbers in a problem-solving setting. It encourages students to notice patterns and to organize their work.

### Using the Pages

After students have played the game, have them make a prediction of which sum they think would occur most often. Have students tell which sums they received in the game and record them on the board. Encourage students to change their guesses based on this additional information. Ask students if they think they have found all of the possible sums. Then ask how they can be sure. Lead them in a discussion of how they might organize the combinations of cards and *list all the possibilities*. Then allow time for them to complete a list.

For Problem 3, there are 20 different possibilities for three cards. They give 10 different sums.

$1 + 2 + 3 = 6$	$2 + 3 + 4 = 9$
$1 + 2 + 4 = 7$	$2 + 3 + 5 = 10$
$1 + 2 + 5 = 8$	$2 + 3 + 6 = 11$
$1 + 2 + 6 = 9$	$2 + 4 + 5 = 11$
$1 + 3 + 4 = 8$	$2 + 4 + 6 = 12$
$1 + 3 + 5 = 9$	$2 + 5 + 6 = 13$
$1 + 3 + 6 = 10$	$3 + 4 + 5 = 12$
$1 + 4 + 5 = 10$	$3 + 4 + 6 = 13$
$1 + 4 + 6 = 11$	$3 + 5 + 6 = 14$
$1 + 5 + 6 = 12$	$4 + 5 + 6 = 15$

Once students have listed all the possibilities, ask them to tally each of the possible sums to see which sum occurs most often. Have students *find a pattern* in the column of occurrences.

Sum	Number of Occurrences
6	1
7	1
8	2
9	3
10	3
11	3
12	3
13	2
14	1
15	1

(Continued on page 39.)

## Using Problem-Solving Strategies

# THE SUM GAME

John and Sara are playing a game with a set of 6 cards with the numbers 1, 2, 3, 4, 5, and 6 written on them. Sara gave John three of the cards and kept the other three cards for herself. The person with the higher sum wins a point. *What are the possible sums that John and Sara could have?*



*What sums do you think John and Sara might get most often?*

Find a partner and play the game that John and Sara were playing. Use 6 cards with each of the numbers from 1 to 6 written on them. Take turns dealing 3 cards to each other. Add the numbers on the 3 cards and write the sum on a piece of paper. The person with the higher sum wins a point. Do this 10 times. The person with the most points wins.

1. What numbers did you get for the sum? If you played the game again, which sum do you think would occur most often? Give reasons for your guess.

**See Using the Pages.**

2. Compare the sums that you and your partner found with those of others in the class. Based on this information, which sums do you think would occur most often?

**Answers will vary.**



## BASIC: Quotation Marks in PRINT Statements

A *computer program* is a set of instructions that tells a computer what to do. A computer does a program in the order of the line numbers.

```
10 PRINT "COMPUTER PROGRAM"
```

↑ line number

The computer will print only what is in quotation marks.

END tells the computer to stop. It is not printed.

```
20 PRINT "IS WRITTEN IN"
10 PRINT "THIS PROGRAM"
40 END
30 PRINT "BASIC LANGUAGE."
```

When this program is run on a computer, this is printed.

```
THIS PROGRAM
IS WRITTEN IN
BASIC LANGUAGE.
```

Tell what would be printed for each program. **See margin.**

1. 20 PRINT "VERY FAST."  
10 PRINT "COMPUTERS ARE"  
30 END
2. 20 PRINT "COMPUTER KNOW?"  
30 END  
10 PRINT "WHAT DOES A"
3. 40 END  
20 PRINT "ONLY WHAT YOU"  
10 PRINT "A COMPUTER KNOWS"  
30 PRINT "TELL IT,"

## Assignment Guide

basic 1–10  
average 1–10  
enriched 1–10

(Continued from page 38.)

Using the table, students can see that the answer to Problem 9 is 9, 10, 11, and 12 which each occur 3 times. In Problem 10, students look back at their predictions (Problems 1–2) to see if they chose one of these numbers.

## Computer

BASIC is one of many computer languages. It is the one most commonly used on microcomputers in homes and schools.

If students are going to try these programs on a microcomputer, remind them that they need to press the RETURN or ENTER key after each line is typed to enter the information into the computer's memory. If they have made a typing error outside the quotation marks, the computer screen will display a "syntax error." A typing error (or anything) inside the quotation marks will be copied as it is.

Some microcomputers allow a question mark to be typed instead of the word PRINT. If your computer has this capability, it will save typing time.

Type the command LIST after typing these programs. The program lines will be listed in order.

The command to tell the computer to do the program, after it is all typed in, is RUN. RUN is typed without a line number since it is a direct command to the computer rather than part of the program.

## Follow-Up

Using the same six cards, have three students play the game. Each player gets 2 cards and finds the sum. How many sums are possible? [15 sums] What are the possible sums? [3, 4, 5, . . . 11] Which sum or sums occur most often? [7]

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

1.  $7 - 5$  [2]    2.  $11 - 8$  [3]
3.  $16 - 9$  [7]    4.  $13 - 7$  [6]
5.  $8 - 0$  [8]    6.  $14 - 7$  [7]

## Computer Answers, page 39

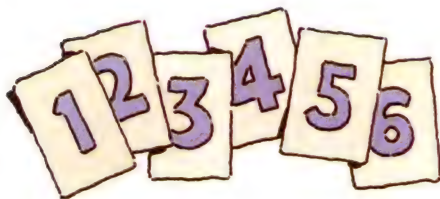
1. COMPUTERS ARE  
VERY FAST.
2. WHAT DOES A  
COMPUTER KNOW?
3. A COMPUTER KNOWS  
ONLY WHAT YOU  
TELL IT.

3. Work with your partner to find all possible sums. List all ways each sum can be made with the six cards.

**See Using the Pages.**

4. Which three cards have the smallest sum? What is this sum?

**3, 2, 1; 6**



5. Which cards would have a sum of 7? Is there more than one way of getting this sum?

**4, 2, 1; no**

6. Which cards would have a sum of 8? Is there more than one way of getting this sum?

**5, 2, 1; 4, 3, 1; yes**

7. Which cards would have a sum of 9? How many ways can you get this sum?

**6, 2, 1; 5, 3, 1; 4, 3, 2; 3 ways**

8. What is the largest possible sum?

**15**

9. Which sums occur most often? How many times do they occur?

**12, 11, 10, 9; each occurs 3 times.**

10. Look back at your prediction of which sums would occur most often. Did your guess include the sums listed in Problem 9?

**Answers will vary.**



## Objective 16

Solve problems by using a table.

### Lesson Theme

Social Studies: Population and Land Area

### Materials

- Grid Paper
- Overhead Projector
- School Calendar

## Introduction

**Using Concrete Materials** Tell students that information can be put into a table or a short list to make it clear and easy to understand. Using an overhead projector, display a table listing the months of the year in a column and two blank columns to the right. The first blank column should be labeled "School Days" and the second "Non-school Days." Have students copy the table on grid paper. Then have them use a school calendar to count and list the number of school days and non-school days in the appropriate columns. Ask the students to suggest ways to use this information. [Which school month has the least number of nonschool days, Which would be best to plan short daily projects, and so on]

## Using the Pages

**Teach** Allow students to become familiar with the table. Ask students to state the population and land area of several counties. Review the steps in problem solving and go through the steps on this page carefully. Repeat the example, rounding to the nearest thousand.

**Try** Warn students not to confuse population and land area columns.

**Apply Problem Solving** Expand Problem 10 by asking which counties appear to have the same land area if the land area were rounded to the nearest thousand. [Esmeralda, Eureka, Mineral or Lander, Pershing]

**Make a table** On the board, list the following information:

1. Classroom A has 15 boys and 17 girls.
2. Studying in Classroom B are 19 boys and 17 girls.
3. There are 15 girls and 12 boys enrolled in Classroom C.
4. Of the 30 students in Classroom D, 10 are girls.

Have the students make a table to show this information. Ask students what they will need to do to determine the number of boys in Classroom D. [Subtract.]

## Problem Solving Use a Table

Information is often organized by putting it in a table. This table shows how the population and the land area of eight counties in Nevada might be organized in a reference book.

Name of county	Population	Land area in square miles
Esmeralda	777	3,570
Eureka	1,198	4,182
Humboldt	9,434	9,702
Lander	4,082	5,621
Mineral	6,217	3,765
Pershing	3,408	6,001
Storey	1,459	262
White Pine	8,167	8,904

### Read

Mrs. Lauer's class was studying Nevada. Which has more land area, Esmeralda County or Mineral County?

### Plan

The information needed is in the table given above. Locate the numbers that give the land area of the two counties. Compare the numbers to find which county has more land area.

### Solve

Find the name *Esmeralda* in the first column of the table. Move across to the column for land area. The number is 3,570. The number for Mineral is 3,765.  $3,570 < 3,765$

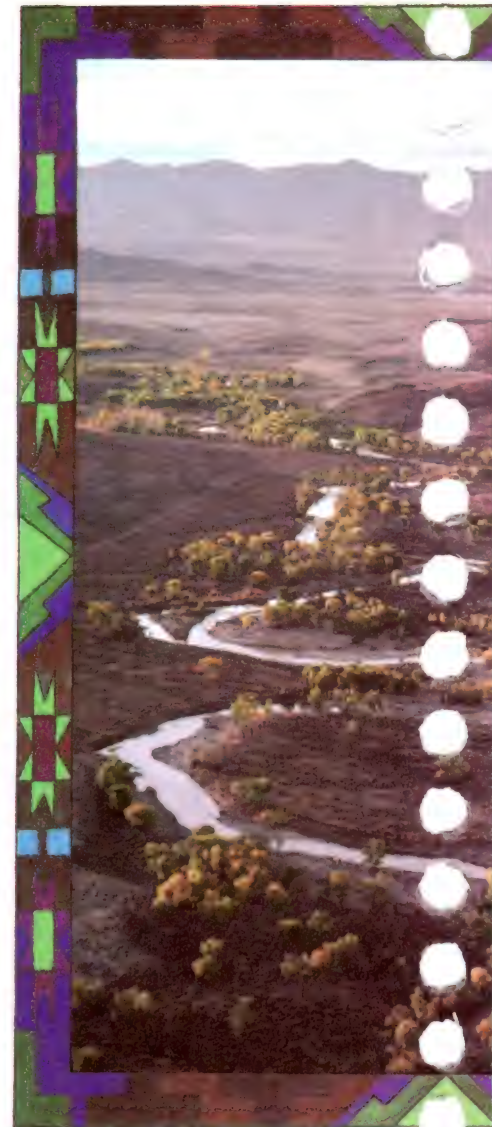
### Answer

Mineral County has more land area.

### Look Back

Check to see that you have read the table correctly.

40



## Practice 16

**Table:**

The table gives driving distances in miles between some cities. To find the distance between two cities, find the number that is in the row for one city and in the column for the other city. The distance between Dallas and Omaha is shaded.

	Boston	Chicago	Dallas	Denver	Miami	Omaha	San Diego
Atlanta	1,108	708	822	1,430	663	1,010	2,146
Boston		1,004	1,753	1,998	1,520	1,469	2,984
Chicago			921	1,021	1,397	479	2,093
Dallas				784	1,343	662	1,348
Denver					2,107	541	1,095
Miami						1,636	2,678
Omaha							1,632
San Diego							

Use the table to give each answer. Round to the nearest hundred.

1. What is the distance from Dallas to Miami?  
**1,300 miles**
2. What is the distance from Denver to Boston?  
**2,000 miles**
3. What is the distance from Chicago to Omaha?  
**500 miles**
4. What is the distance from Boston to San Diego?  
**3,000 miles**
5. What is the distance from Atlanta to Miami?  
**700 miles**
6. Which is greater, the distance from Boston to Chicago, or the distance from Boston to Miami?  
**Boston to Miami**
7. Which is less, the distance from Dallas to Denver, or the distance from Dallas to Chicago?  
**Dallas to Denver**
8. A salesman will drive from Chicago to Omaha, then from Omaha to Denver. What distance will he travel on this trip?  
**1,000 miles**

## Reteaching 16

**Table:**

A maple tree can grow to be 116 feet tall. Its trunk can be 19 feet around.

Type of tree	Height	Distance around trunk
Sycamore	114 feet	26 feet
Pecan	130 feet	21 feet
Hickory	171 feet	12 feet
Oak	78 feet	35 feet
Cherry	64 feet	18 feet
Maple	116 feet	19 feet
Poplar	90 feet	10 feet

Give the height of each tree.

1. Oak **78 feet**
2. Hickory **171 feet**
3. Pecan **130 feet**
4. Poplar **90 feet**
5. Sycamore **114 feet**
6. Cherry **64 feet**
7. Which tree is the tallest?  
**Hickory**
8. Which tree is the shortest?  
**Cherry**

Give the distance around the trunk of each tree.

9. Poplar **10 feet**
10. Sycamore **26 feet**
11. Hickory **12 feet**
12. Pecan **21 feet**
13. Cherry **18 feet**
14. Oak **35 feet**
15. Which tree has the thickest trunk?  
**Oak**
16. Which tree has the thinnest trunk?  
**Poplar**



## Assignment Guide

basic	1–8, 11
average	1–9, 11
enriched	1–11

**More Practice Set 16,**  
page 357

**Homework to do with others** With the help of another person, have each student find the current population of his or her community and the population 10 years ago. In a discussion with the other person, have each student determine whether the population has increased, decreased, or remained about the same. Have students report their findings and their source to the class.

## Follow-Up

**Extra Practice** Have students make up a table giving the number of students in each classroom in the school. Have students use this information to write problems similar to those in the *Apply* section.

**Enrichment Use data from outside the text** Have students research populations of nearby towns (less than 10,000), list the information in a table, round to the nearest thousand, and order the populations from least to greatest.

## Computer Assisted Instruction

Strategies in Problem Solving  
• Dinosaurs and Squids, Activity 1

## Cooperative Learning Groups

See page 475 of this Teacher's Edition.

## Daily Maintenance

Write each number in standard form.

- $2,000 + 800 + 40 + 7$  [2,847]
- $6,000 + 100 + 9$  [6,109]
- $3,000 + 70 + 2$  [3,072]
- $9,000 + 800 + 30$  [9,830]
- $4,000 + 500$  [4,500]
- $5,000 + 90$  [5,090]

**Try** Solve each problem. Use the table on page 40.

- Find the populations of Mineral, Humboldt, and White Pine counties. List them in order from greatest to least.  
**9,434 8,167 6,217**
- Find the population of Esmeralda County to the nearest hundred.  
**800 people**

**Apply** Solve each problem. Use the table on page 40.

- Find the land area of Esmeralda County to the nearest thousand square miles.  
**4,000 square miles**
- Find the population of Storey County to the nearest hundred.  
**1,500 people**
- Find the land area of Storey County to the nearest ten square miles.  
**260 square miles**
- Which is less, the population of Storey County or the population of Eureka County?  
**Eureka County**
- Which is less, the land area of Mineral County or the land area of Esmeralda County?  
**Esmeralda County**
- To the nearest thousand square miles, what is the land area of Pershing County?  
**6,000 square miles**
- To the nearest thousand, what is the population of Mineral County?  
**6,000 people**
- Find the land areas of Eureka, Storey, and Lander counties. List them in order from least to greatest.  
**262 4,182 5,621**
- Which counties have more people than square miles of land?  
**Mineral and Storey counties**
- If the population of each county was rounded to the nearest thousand, which counties would appear to have the same population? **Esmeralda, Eureka, and Storey counties**
- Calculator** What is the total population of the eight counties listed in the table? **34,742**

More Practice Set 16, page 357 41

## Enrichment 16

Progress		E16	
Date	Invention	Date	Invention
1448	Printing press	1903	Airplane
1584	Lead pencil	1926	Television
1590	Microscope	1938	Ballpoint pen
1642	Calculator	1946	Electronic computer
1790	Dental drill	1977	Video cassette recorder
1839	Bicycle	1981	Space shuttle

The table shows when each item was invented.

Round the current year and the dates in the table to the nearest 100 years. Subtract to find about how many years ago the item was invented.

1. Microscope <b>400 years</b>	2. Television <b>100 years</b>
3. Printing press <b>600 years</b>	4. Ballpoint pen <b>100 years</b>
5. Calculator <b>400 years</b>	6. Space shuttle <b>0 years</b>

Round the dates in the table to the nearest 100 years. Subtract to find about how many years passed between the invention of one item and the other.

7. Printing press to television <b>500 years</b>	8. Lead pencil to ballpoint pen <b>300 years</b>
9. Television to video cassette recorder <b>100 years</b>	10. Calculator to electronic computer <b>300 years</b>
11. Microscope to dental drill <b>200 years</b>	12. Bicycle to airplane <b>100 years</b>
13. Bicycle to space shuttle <b>200 years</b>	14. Airplane to space shuttle <b>100 years</b>

## Additional Resource 16

Maintenance		Additional Resource 16		
Subtract		16		
1. $\begin{array}{r} 8 \\ -5 \\ \hline 3 \end{array}$	2. $\begin{array}{r} 11 \\ -3 \\ \hline 8 \end{array}$	3. $\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$	4. $\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$	5. $\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$
6. $\begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array}$	7. $\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$	8. $\begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$	9. $\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$	10. $\begin{array}{r} 10 \\ -3 \\ \hline 7 \end{array}$
11. $\begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array}$	12. $\begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array}$	13. $\begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array}$	14. $\begin{array}{r} 0 \\ -0 \\ \hline 0 \end{array}$	15. $\begin{array}{r} 12 \\ -6 \\ \hline 6 \end{array}$
16. $\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$	17. $\begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array}$	18. $\begin{array}{r} 8 \\ -0 \\ \hline 8 \end{array}$	19. $\begin{array}{r} 11 \\ -8 \\ \hline 3 \end{array}$	20. $\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$
21. $\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$	22. $\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$	23. $\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$	24. $\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$	25. $\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$
26. $\begin{array}{r} 10 \\ -8 \\ \hline 2 \end{array}$	27. $\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$	28. $\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$	29. $\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$	30. $\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$
31. $\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$	32. $\begin{array}{r} 10 \\ -4 \\ \hline 6 \end{array}$	33. $\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$	34. $\begin{array}{r} 14 \\ -5 \\ \hline 9 \end{array}$	35. $\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$



## Objective 17

Write numbers through 999,999 and give the place value for any digit in a number through 999,999.

### Lesson Theme

Social Studies: Cotton Production

### Vocabulary

Ten-thousands, hundred-thousands

### Materials

- Place-Value Charts (Teaching Aid C)
- Cards (2 sets, 0–9)

## Introduction

**Using Concrete Materials** Have students use digit cards to display and read aloud several four-digit numbers. Explain the meaning of ten-thousand and hundred-thousand. Have students name and display several five- and six-digit numbers. Then have them write these examples in place-value charts.

**Motivational Situation** Pose the following problem to the students. Suppose you are a writer working on a Social Studies textbook. You need to include a table showing the highest cotton producing states in the United States in 1982, 1983, 1984, and 1985. What are some things you need to know? [Which states produce cotton, how much cotton each state produced each year]

## Using the Pages

**Teach** Read and discuss the examples. In Example B, ask the students to tell what the 4 means in each number [4 thousands; 4 hundreds]

**Practice Error Analysis** Watch for students who are confused by the use of zero as a placeholder. Have these students use place-value charts and digit cards to display and read aloud large numbers containing zero as a placeholder.

**Apply Problem Solving** Students may find it interesting to know that the United States is one of the major cotton-growing countries in the world. Also tell them that a bale of cotton weighs about 500 pounds.

In Problems 21–23, point out that the use of the word *about* indicates that the number given is an approximation.

**Calculator** If students have difficulty solving Problem 24, show them how to change the 2 to 8 by adding 60. Then have them decide how to change the 1 to 6.

## Ten-Thousands and Hundred-Thousands

- a. In 1980, Alabama produced about two hundred seventy-five thousand bales of cotton. Write this number in standard form.

hundred-thousands	ten-thousands	thousands	hundreds	tens	ones
2	7	5	0	0	0

$$200,000 + 70,000 + 5,000 \leftarrow \text{Expanded form}$$

$$275,000 \leftarrow \text{Standard form}$$

- b. Tell what the 3 means in each number.

364,152  
 $\uparrow$  3 hundred-thousands

932,470  
 $\uparrow$  3 ten-thousands

**Try** Write each number in standard form.

- a. forty-four thousand, six hundred seventeen  
 44,617

- b.  $100,000 + 20,000 + 7,000 + 40 + 3$   
 127,043

- c. Tell what the 8 means in 84,375.  
 8 ten-thousands

- d. Tell what the 5 means in 563,274.  
 5 hundred-thousands



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## Practice 17

Write what the 7 means in each number

1. 58,705 7 hundreds

2. 7,432 7 thousands

3. 47,235 7 thousands

4. 79,342 7 ten-thousands

5. 760,835 7 hundred-thousands

Write each number in standard form

6. Three hundred twenty-seven thousand 327,000

7. Sixty-six thousand, four hundred ninety-nine 66,499

8. Eleven thousand 11,000

9. Seven hundred fifty-one thousand nine hundred nine 751,909

Shade each box that has an 8 in the ten-thousands place. The letters in the shaded boxes spell the name of a city in Florida.

81,180 T	23,789 E	187,000 A	480,000 L
819,765 O	189,123 L	8,543 P	485,679 A
480,909 H	800,000 T	280,345 A	85,111 S
238,976 B	280,976 S	765,890 R	189,097 E
239,876 E	809,809 I	87,543 E	876,005 S

## Reteaching 17

Name \_\_\_\_\_ R17

hundred-thousands	ten-thousands	thousands	hundreds	tens	ones
6	7	5	4	2	9

675,429  
 This means 7 ten-thousands

Finish this one

Write the standard form.

1. two hundred thirty-nine thousand, one hundred seventeen 239,117

2. four hundred sixty thousand, nine hundred seventy-three 460,973

3. fifty-eight thousand, two hundred 58,200

4. nine hundred ninety-nine thousand, nine hundred ninety-nine 999,999

Tell what the 8 means in each number

5. 64,581 8 tens

6. 809,123 8 hundred-thousands

7. 518,470 8 thousands

8. 591,028 8 ones

9. 283,414 8 ten-thousands

10. 12,876 8 hundreds



## Assignment Guide

basic	1–21, 24
average	1–24
enriched	1–24

**More Practice Set 17,**  
page 358

## Follow-Up

**Extra Practice** Write various expanded-form numbers on the chalkboard and have students write them in standard form. Use numbers up to and including 999,999.

**Reteaching** Have students place the numbers in Exercises 11–20 in a place-value chart.

## Enrichment Use data from outside

**the text** Have students find answers to questions such as: What is the distance around the Earth? [About 25,000 miles at the equator] What is the deepest point in the Atlantic Ocean? [28,374 feet] What is the highest mountain in the world? [Mt. Everest at 29,028 feet] How high does a commercial jet plane usually fly? [Between 30,000 and 45,000 feet]

Then have students make a poster of the questions and answers and display it in the classroom.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Numeration 2, Activity 4

## Daily Maintenance

Complete each pattern.

- 1, 3, 5, , , , [7, 9, 11]
- 2, 4, 6, , , , [8, 10, 12]
- 10, 20, 30, , , , [40, 50, 60]
- 5, 10, 15, , , , [20, 25, 30]
- 100, 200, 300, , , , [400, 500, 600]

## Answers, page 43

- 4 hundreds
- 4 ten-thousands
- 4 hundred-thousands
- 4 thousands
- 4 ten-thousands
- 4 hundred-thousands
- 4 ten-thousands
- 4 hundreds
- 4 tens
- 4 ones

**Using Problem-Solving Strategies,** page 413

**Practice** Write each number in standard form.

- $40,000 + 6,000 + 300 + 20 + 9$   
**46,329**
- $300,000 + 50,000 + 7,000$   
**357,000**
- $600,000 + 70,000 + 5,000 + 90$   
**675,090**
- $80,000 + 5,000$   
**85,000**
- seventy-two thousand, five hundred sixty-four  
**72,564**
- fifty-one thousand, eight hundred twenty-three  
**51,823**
- three hundred forty-five thousand, nine hundred  
**345,900**
- six hundred twelve thousand, five hundred forty  
**612,540**
- five hundred twenty-one thousand  
**521,000**
- nine hundred thirty-two thousand  
**932,000**

Tell what the 4 means in each number. **See margin.**

- 31,490
- 45,271
- 421,863
- 304,295
- 142,705
- 470,958
- 745,680
- 19,456
- 82,543
- 803,754

**Apply** For problems 21–22, write the given number in standard form.

- In 1980, Georgia produced about eighty-six thousand bales of cotton.  
**86,000**
- In 1980, Oklahoma produced about two hundred five thousand bales of cotton.  
**205,000**
- Estimation** South Carolina produces about 100,000 bales of cotton each year. Tell whether this number is exact or estimated.  
**Estimated**
- CALCULATOR** Enter 3,124 on your calculator. Without using the clear  key, change the 2 to 8, and the 1 to 6 so the display shows 3,684. How can you do this? **Add 60 and add 500**



Using Problem-Solving Strategies, page 413  
More Practice Set 17, page 358 **43**

## Enrichment 17

Name \_\_\_\_\_ E17

**Cross-Number Puzzle I**

Use these clues to complete the cross-number puzzle.

<b>Across</b>	<b>Down</b>
5. 10 thousand more than 123,452	1. Eight hundred twelve thousand, ten
7. 100 thousand more than 700,000	2. 10 thousand less than 63,726
8. One hundred fifty-seven thousand, two hundred ninety-four	3. 1 hundred more than 40,200
9. 1 thousand less than 54,924	4. 100 thousand more than 108,754
10. 10 thousand less than 25,783	6. Two hundred five thousand, three hundred four
	7. 10 thousand less than 899,121

## Additional Resource 17

Name \_\_\_\_\_ Additional Resource 17

**Maintenance**

Write the numbers in order from least to greatest.

- 53, 239, 147  
53, 147, 239
- 2,000; 435; 799  
435, 799, 2,000
- 987; 3,001; 2,189  
987, 2,189, 3,001
- 7,521; 1,435; 1,076  
1,076, 1,435, 7,521
- 2,014; 4,012; 1,024; 1,402  
1,024, 1,402, 2,014, 4,012

Compare the numbers. Use < or >.

- 237 < 1,000
- 1,495 < 999
- 5,102 < 4,953
- 2,758 < 2,800
- 5,555 < 5,666
- 8,000 < 1,999
- 4,250 < 4,520
- 7,395 < 9,375
- 999 < 1,000
- 8,700 < 8,643

Write the number that is 100 greater.

- 235 335
- 4,267 4,367
- 67 167
- 5,850 5,950
- 6,900 7,000
- 8,190 8,290



## Objective 18

Write numbers and give the place value for any digit in a number through 999,999,999.

### Lesson Theme

Social Studies: Cotton Production

### Vocabulary

Millions, ten-millions, hundred-millions

### Materials

- Place-Value Charts (Teaching Aid C)
- Cards (1 set, 0–9)

## Introduction

**Using Concrete Materials** Write 342,167,495 on the chalkboard. Have students name places they know and tell what digit is in each place. Explain that the new places are millions, ten-millions, and hundred-million. Give each of nine students a digit card and ask them to arrange themselves to show a number. Have a student read the number aloud. Give the remaining digit card to another student and ask him/her to replace the student in the thousands place. Have a student read the new number. Giving a digit card to a new student, repeat the process until all the places have been changed.

**Motivational Situation** Pose the following to the students. Suppose you wanted to collect one million bottle caps. What would you need to consider? What problems do you think you might encounter? [Storage, supply, counting, inventory, and so on]

## Using the Pages

**Teach** Read and discuss the examples. Point out how commas help in reading large numbers, and explain that a comma is used to separate millions from hundred-thousands.

**Practice Error Analysis** Watch for students having difficulty doing Exercises 5 and 6. Have them write the numbers in a place-value chart. (See Reteaching 18.)

**Apply Problem Solving** These problems contain more information relating to cotton.

**Find a pattern** Have students find how many ones are in one ten, how many tens are in one hundred, and so on through how many hundred-thousands are in one million. Students should see that each successive place is 10 of the previous place.

**Calculator** Most hand-held calculators have an 8-digit display. For Problem 25, most students should write 99,999,999 in words.

(Continued on page 45.)

## Millions

- a. In 1980, Arizona produced about six hundred eighty-four million, four hundred eighty thousand pounds of cotton. Write this number in standard form.

hundred-millions	ten-millions	millions	hundred-thousands	ten-thousands	thousands	hundreds	tens	ones
6	8	4	4	8	0	0	0	0

**684,480,000** ← Standard form

- b. Tell what the 5 means in each number.

**563,208,174**  
← 5 hundred-millions

**357,702,148**  
← 5 ten-millions

**65,342,000**  
← 5 millions

**Try** Write each number in standard form.

- a. seven million, two hundred eleven thousand, nine hundred forty-one  
**7,211,941**

- b. six hundred fourteen million, five hundred ten thousand, eight  
**614,510,008**

Tell what the 3 means in each number.

- c. 3,456,000  
**3 millions**

- d. 4,539,275  
**3 ten-thousands**

- e. 32,908,150  
**3 ten-millions**

- f. 903,861,547  
**3 millions**

**Practice** Write each number in standard form.

- six hundred twelve million, nine hundred seventy-six thousand, four hundred sixteen  
**612,976,416**
- nine million, one hundred three thousand, two hundred twelve  
**9,103,212**
- twenty-seven million, fifty-two thousand, nineteen  
**27,052,019**

- one hundred eighty-two million, six hundred seventeen thousand, eight hundred seven  
**182,617,807**
- four million, three hundred ten thousand, nine hundred eighteen  
**4,310,918**
- ninety-eight million, twenty-one thousand, seventy-eight  
**98,021,078**

Tell what the 5 means in each number. **See margin.**

7. 5,027,431

8. 52,324,009

9. 540,916,278

10. 65,092,781

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## Practice 18

Name \_\_\_\_\_ P18

Write what the 4 means in each number.

- 5,402,890 4 hundred-thousands
- 4,789,000 4 millions
- 45,123,009 4 ten-millions
- 67,540,223 4 ten-thousands
- 408,567,765 4 hundred-millions
- 704,703,702 4 millions

Write each number in standard form.

- Four million, six hundred three thousand 4,603,000
- Ninety million, forty-four thousand, seventy-eight 90,044,078
- Five hundred seventy-three million 573,000,000
- Five hundred seventy-three million, three hundred eleven thousand, eight hundred 573,311,800

Solve each problem.

- Last year, the students at Midland School collected 1,425,236 aluminum cans. Write this number in words. One million, four hundred twenty-five thousand, two hundred thirty-six
- Two years ago, the students at Midland School collected 1,115,079 aluminum cans. Write this number in words. One million, one hundred fifteen thousand, seventy-nine

## Reteaching 18

Name \_\_\_\_\_ R18

Write the standard form.

- eight hundred seventy-three million, six hundred twenty-two thousand, four hundred ninety-five 873,622,495
- twenty-four million, one hundred thirty-six thousand, eight hundred 24,136,800
- one million, three hundred seventy thousand, two hundred eight 1,370,208
- seven hundred seventy-seven million, seven hundred seventy-seven thousand, seven hundred seventy-seven 777,777,777

What does the 5 mean in each number?

- 250,879,241 5 ten-millions
- 78,587,111 5 hundred-thousands
- 507,996,322 5 hundred-millions
- 128,357,004 5 ten-thousands



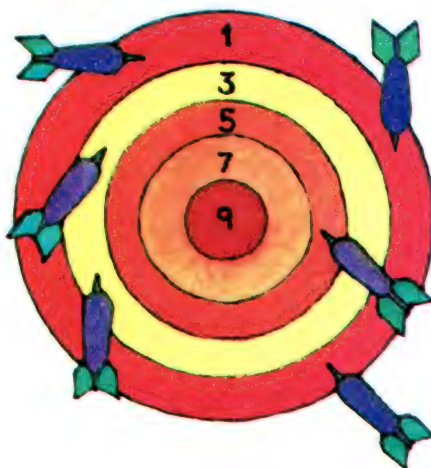
11. 17,205,148      12. 3,510,264      13. 2,057,267      14. 573,681,042  
15. 43,518,240      16. 2,350,491      17. 625,403,981      18. 508,672,304

**Apply** Solve each problem.

19. In 1980, New Mexico produced about 54,720,000 pounds of cotton. Write this number in words.  
**Fifty-four million, seven hundred twenty thousand**
21. Of the 10 leading cotton-growing countries in the world, 4 are in the Western hemisphere. How many are in the Eastern hemisphere?  
**6 countries**
23. In 1980, the world produced about sixty-four million three hundred thousand bales of cotton. Write this number in standard form.  
**64,300,000**
25. **CALCULATOR** Display the greatest number you can show on your calculator by using just one key. Write this number in words.  
**See margin.**
20. In 1980, Mississippi produced about 548,640,000 pounds of cotton. Write this number in words.  
**Five hundred forty-eight million, six hundred forty thousand**
22. **Estimation** The cotton gin was invented by Eli Whitney in 1793. Is this an estimated number? Write yes or no.  
**No**
24. **Thinking skills** How many hundred-thousands are in one million? How many ten-thousands are in one million? How many thousands are in one million?  
**10, 100, 1000**

Using six darts, Joshua made a score of 14 points. Could he have made the same score with **See Using the Pages.**

26. five darts?  
**No**
27. four darts?  
**Yes**
28. three darts?  
**No**
29. two darts?  
**Yes**



More Practice Set 18, page 358 45

## Assignment Guide

basic	1-14, 15-21 odd, 25-29
average	1-29
enriched	1-29

**More Practice Set 18, page 358**

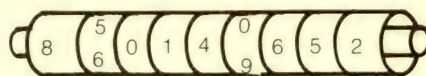
(Continued from page 44.)

**Try and check** For Problems 26-29, point out that Joshua got his score using 6 darts. Also point out that they may add the same number more than once. Students should try adding five numbers, listing each attempt. Have them repeat the process with four, three, and two numbers.

If students do not discover the pattern, you may wish to explain that when odd numbers are added, an even number of addends will give an even sum, while an odd number of addends will give an odd sum.

## Follow-Up

**Extra Practice** Arrange on a cardboard tube nine revolving strips of paper numbered vertically, as shown below. Turn the strips and have students say the numbers.



**Reteaching** Have students read Exercises 7-14 aloud.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Numeration 2, Activities 5, 7

## Daily Maintenance

Give the expanded form for each number.

- 356 [300 + 50 + 6]
- 1,347 [1,000 + 300 + 40 + 7]
- 56,239 [50,000 + 6,000 + 200 + 30 + 9]
- 28,711 [20,000 + 8,000 + 700 + 10 + 1]
- 133,269 [100,000 + 30,000 + 3,000 + 200 + 60 + 9]

## Answers, page 45

- 5 millions
- 5 ten-millions
- 5 hundred-millions
- 5 millions
- 5 thousands
- 5 hundred-thousands
- 5 ten-thousands
- 5 hundred-millions
- 5 hundred-thousands

Answers are continued on page 49 of this Teacher's Edition.

## Enrichment 18

Name \_\_\_\_\_ E18

**Cross-Number Puzzle II**

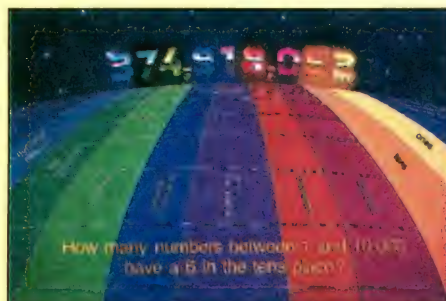
**Across**

- Thirty-six million, two hundred
- Two million, two thousand, fifty
- How many thousands in 54,004,074?
- How many millions in 265,840?
- Four million, three hundred thousand, seven
- 1 thousand more than 998,400

**Down**

- Three million, twenty-four thousand
- Two hundred five thousand, four
- Five million, two thousand, seven hundred
- How many millions in 40,256,117?
- 10 thousand less than 10,200
- Forty-nine more than zero
- Three hundred ninety

## Additional Resource 18



## Math Poster F Place Value

There are 1,000 numbers between 1 and 10,000 that have a 6 in the tens place. Use this poster for reference as a place-value chart to help students learn the names for each of the place values. See Answer Key for a discussion of the problem and suggested activities to use for place value.



## Objective 19

Choose sensible answers to problems.

### Lesson Theme

Music: School Band

### Materials

- Hundreds, Tens, Units (Punchouts, Math Kit)
- Overhead Projector

## Introduction

**Using Concrete Materials** On the darkened stage of an overhead projector, use counters to display the number 27. Then flip the light on for only a second or two. Ask the students if they saw about three, thirty, or three hundred counters on the screen. Have them discuss why the two incorrect answers (3 and 300) are unreasonable.

Remind students that we often see or hear numbers that make no sense. For example, if a newspaper article said that the President is having a birthday celebration and is 16 years old today, the number 16 would make no sense. In this case, the newspaper probably would have made a mistake in typesetting. Ask students if they can think of other numbers they have seen or heard that make no sense.

## Using the Pages

**Teach** After discussing the example, tell the class that all the exercises will have three choices. Point out that students should consider all three choices before deciding on an answer.

**Try Error Analysis** Watch for students who seem to be guessing. Ask these students to explain why each answer makes sense or no sense.

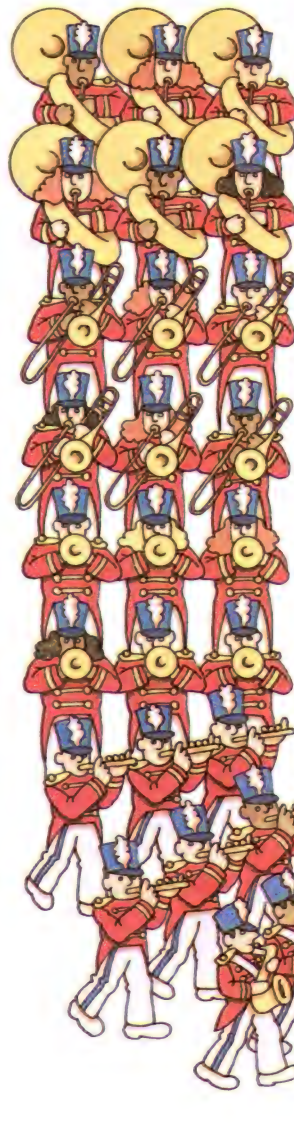
Discuss with students some of the criteria they might apply to choose the most sensible answer. [What do I already know about the situation? Can I defend the answer I choose? Do the numbers make sense?]

**Apply Problem Solving** In Problems 1–9, suggest that students use what they know about the situations presented to help them discriminate between choices that are sensible and those that are not. For Problem 10, be sure students are aware that you will accept any answer that they can reasonably defend.

**Write a problem** Have about half of the students work in 3 small groups. Give each group these three numbers: 4, 40, and 400. Have them write a problem for which one of the numbers would be reasonable and the other two would not. Make sure that one group is (Continued on page 47.)

### Problem Solving

### Give Sensible Answers



#### Read

At Columbus School, 50 students are in the marching band. Many other students are not in the band. Which of the choices below tells about how many students are at Columbus School?

5    50    500

#### Plan

Think about each of the three choices. Choose the answer that is most sensible.

#### Solve

There are more students in the school than in the band, and 500 is the only choice greater than 50.

#### Answer

There are about 500 students at Columbus School.

#### Look Back

The other choices are not sensible.

- There could not be fewer students in the school than in the band. So 5 is not a sensible answer.
- There are students in the school who are not in the band. So 50 is not a sensible answer.




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## Practice 19

Name: \_\_\_\_\_

The Morales family went to a baseball game in August. P19












Answer each of the following questions. Choose the most sensible answer.

- How many people sat in the bleachers?  
20    200    2,000
- How many hours did the game last?  
3    30    300
- How many baseball caps were sold by one vendor?  
70    7,000    70,000
- What was the cost of a ticket to the game?  
\$0.40    \$4.00    \$40.00
- How many ushers were on duty to show people to their seats?  
8    85    8,500
- How much did Mr. Morales pay for a baseball cap?  
\$3.50    \$35.00    \$350.00
- How many runs were scored?  
9    90    900
- A trumpet player played the national anthem before the game. How many minutes long was the performance?  
5    50    500
- How many pitchers played in the game?  
2    20    200
- How many baseball players sat in the dugout of the visiting team?  
1    10    100

## Reteaching 19

Name: \_\_\_\_\_

Match each picture to the most sensible answer. R19

-  1 flower    10 flowers    100 flowers
-  1 flower    10 flowers    100 flowers
-  1 flower    10 flowers    100 flowers
-  2 tires    20 tires    200 tires
-  2 tires    20 tires    200 tires
-  2 tires    20 tires    200 tires
-  4 apples    40 apples    400 apples
-  4 apples    40 apples    400 apples
-  4 apples    40 apples    400 apples



Accept varied student responses for questions regarding reasonable answers. See Using the Pages in this lesson for further suggestions.

**Try Estimation** Choose the most sensible answer.

Explain why the other choices are not sensible.

- How many times does the school band practice each week?  
5    50    500  
**5**
- The 50 band members sit in rows. About how many are in each row?  
1    10    100  
**10**

**Apply Estimation** Choose the most sensible answer.

Explain why the other choices are not sensible.

- The Columbus School Band had a concert. How many people came?  
2    200    200,000  
**200**
- How many of the 50 band members play the drums?  
6    60    600  
**6**
- Jamie practices her flute at home every day. How many hours does she practice at home each week?  
7    17    70  
**7**
- The band members are raising money for 50 new uniforms. How much do they need to raise?  
\$3    \$30    \$3,000  
**\$3,000**
- The band played at a school football game. The stands were filled. About how many people were there?  
8    18    800  
**800**
- What was the cost of a ticket to the Columbus School Band concert?  
\$1    \$10    \$100  
**\$1**
- How many minutes does the school band practice each day?  
4    45    450  
**45**
- During the school year, the band plays once a month at a school assembly. How many times each year do they do this?  
1    5    10  
**10**
- The band members had a car wash to raise money. How much did they charge to wash a car?  
\$2    \$20    \$200  
**\$2**
- Fill in the blanks with numbers that are sensible answers. Then explain why each number is sensible.  
Columbus School has an orchestra with █ members. There are █ members who play stringed instruments. The orchestra made about █ at its last concert when each ticket cost █ and about █ people attended. The orchestra played █ pieces of music which took about █ hours. **Answers will vary. A sample is given.**  
**25 members; 15 members; \$1,000; \$2.00; 500 people; 20 pieces; 2 hours**



More Practice Set 19, page 358 **47**

## Assignment Guide

basic	1-10
average	1-10
enriched	1-10

**More Practice Set 19, page 358**

**Homework to do with others** Have each student ask 3 or 4 people to explain how they use estimation in their daily lives. Tell students to include questions about how often estimation is used and what importance estimation has in their discussions with other people. Have students report briefly to the class.

(Continued from page 46.)

working with each of the numbers. Assign similar numbers to 3 other small groups.

## Follow-Up

**Reteaching** Have students tell the answers to the following:

- About how much does a pair of shoes cost?  
25¢    \$2.50    \$25.00    [**\$25.00**]
- How many weeks a year can you go to summer camp?  
4    40    400    [**4**]
- Approximately how many students are in Jackie's class at school?  
3    30    300    [**30**]

**Enrichment Write a problem** Have students write word problems of their own similar to those in the text, exchange problems with other classmates, and solve the problems.

## Reading and Writing Mathematics

Have students list all the possible whole numbers which, rounded to the nearest 10, are equal to 30. [25, 26, 27, 28, 29, 30, 31, 32, 33, 34] To 70 [65, 66, 67, 68, 69, 70, 71, 72, 73, 74] To 10 [5, 6, 7, 8, 9, 10, 11, 12, 13, 14]

## Daily Maintenance

Compare the numbers. Use < or >.

- 472 **>** 198
- 657 **>** 639
- 2,801 **<** 5,117
- 1,939 **>** 1,916
- 7,743 **<** 7,748
- 5,887 **>** 4,935

## Enrichment 19

Name \_\_\_\_\_ E19

**About How Many Is That?**

For each question, decide which answer is most sensible.

- About how many people live in Chicago, Illinois? **C**
- About how many students go to the Oakdale Elementary School? **C**
- About how many miles high is Mount Whitney in California? **A**
- About how many years did the oldest dog live? **B**
- About how many miles is it from Orlando, Florida to Seattle, Washington? **D**
- Sue Ling is the shortest girl in her class. About how many feet tall is she? **A**
- About how many miles long is the state of Missouri? **C**
- Tom's father is about how many years old? **B**
- About how many people live in the Soviet Union? **F**
- About how many miles can Jenny run in a half hour? **A**
- A wren is about how many inches long? **A**

**Answers**

A. 3  
B. 30  
C. 300  
D. 3,000  
E. 3,000,000  
F. 300,000,000

## Additional Resource 19

Name \_\_\_\_\_ Additional Resource 19

**Maintenance**

- Mark 534 with an X on this number line.  
500    510    520    530    540    550  
Is 534 closest to 500, 510, 520, 530, 540, or 550? **530**  
Round 534 to the nearest ten. **530**
- Mark 3,412 with an X on this number line.  
3,100    3,200    3,300    3,400    3,500    3,600  
Is 3,412 closest to 3,100, 3,200, 3,300, 3,400, 3,500, or 3,600? **3,400**  
Round 3,412 to the nearest hundred. **3,400**

Round each number to the nearest ten.

3. 47 <b>50</b>	4. 132 <b>130</b>	5. 470 <b>470</b>
6. 2,188 <b>2,190</b>	7. 706 <b>710</b>	8. 4,476 <b>4,480</b>

Round each number to the nearest hundred.

9. 174 <b>200</b>	10. 3,438 <b>3,400</b>	11. 289 <b>300</b>
12. 2,188 <b>2,200</b>	13. 706 <b>700</b>	14. 4,475 <b>4,500</b>

Round each number to the nearest thousand.

15. 2,188 <b>2,000</b>	16. 5,706 <b>6,000</b>	17. 4,475 <b>4,000</b>
------------------------	------------------------	------------------------



## Chapter 2 Test

An acceptable score for each objective is suggested in the Chapter 2 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

Objective	Test Items	Text pages
9	1-3	24-25
10	4, 5, 11	26-27
11	6, 7, 12	28-29
12	15-17	30-31
13	18-20	32-33
14	21-23	34-35
15	24-26	36-37
16	27, 28	40-41
17	8, 9, 13	42-43
18	10, 14	44-45
19	29, 30	46-47

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
30	100	22	73
29	97	21	70
28	93	20	67
27	90	19	63
26	87	18	60
25	83	17	57
24	80	16	53
23	77	15	50

### Additional Ideas for Evaluation

See pages 464-467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 2 Form for Individualizing
- Cumulative Record Folder

## Chapter 2 Test

Use digits to write each number.

1.  $///$  **3**
2. fifteen **15**
3. sixty **60**

Write each number in standard form.

4. 3 hundreds 4 tens 9 ones **349**
5. two hundred sixteen **216**
6.  $4,000 + 600 + 70 + 5$  **4,675**
7. one thousand, three hundred ten **1,310**
8.  $40,000 + 2,000 + 900 + 80 + 3$  **42,983**
9. five hundred twelve thousand **512,000**
10. one million, six hundred twelve thousand, two hundred nineteen **1,612,219**

Tell what the 3 means in each number.

11. 937 **3 tens**
12. 3,075 **3 thousands**
13. 234,268 **3 ten-thousands**
14. 3,056,274 **3 millions**

Compare the numbers. Use < or >.

15. 362 **>** 354
16. 6,137 **>** 2,845
17. 2,450 **<** 2,470

Write the numbers in order from least to greatest.

18. 372 **286** **465**
19. 142 **137** **147** **236**
20. 3,859 **3,961** **2,847**

48

Round to the nearest ten.

21. 46 **50**
22. 132 **130**

Round to the nearest hundred.

23. 610 **600**
24. 1,793 **1,800**

Round to the nearest thousand.

25. 2,175 **2,000**
26. 8,521 **9,000**

Use this table to solve each problem.

Name of county	Population	Land area in square miles
Esmeralda	777	3,570
Eureka	1,198	4,182

27. Find the population of Eureka County to the nearest hundred. **1,200 people**

28. Which of the two counties shown has the greater land area? **Eureka County**

Choose the most sensible answer.

29. The smallest class in Columbus School has 25 students. How many students are in the largest class?

15 25 35  
**35**

30. The 3 fourth-grade classes went on a field trip. How many students went?

8 80 800  
**80**

## Chapter 2 Letter Home

## Chapter 2 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

### Keeping You Posted

We have designed this page to help you keep track of your progress. It includes a checklist of objectives and a space for you to write your score. We also have a space for you to write a message to your family.

To: Family

Build numbers to complete the cross-number puzzle.

Across

1. 8 hundreds, 5 ones, 0 tens, 6 thousands
3. 7 tens, 1 hundred, 8 ones
5. 4 hundreds, 6 ones, 9 tens
7. 1 thousand, 5 ones, 6 tens, 6 thousands

Down

1. 1 ten, 5 thousands, 3 ones, 6 ten, thousands, 4 hundreds
4. 5 ones, 6 tens, 8 hundreds
6. 3 tens, 5 ten, thousands, 4 thousands, 6 hundred, thousands, 9 ones, 6 hundreds

### Posttest Chapter 2

Use digits to write each number.

1.  $///$  **3**
2. sixteen **16**
3. seventy **70**

Write each number in standard form.

4. 4 hundreds 1 ten 7 ones **417**
5. Four hundred thirty **430**
6.  $6,000 + 300 + 90 + 1$  **6,391**
7. Two thousand, two hundred nineteen **2,219**
8.  $70,000 + 5,000 + 400 + 90 + 8$  **75,498**
9. Eight hundred forty thousand **840,000**
10. Five million, nine hundred ten thousand, three hundred forty-six **5,910,346**

Tell what the 2 means in each number.

11. 729 **Two tens**
12. 2,934 **Two thousands**
13. 428,973 **Two ten-thousands**
14. 2,461,583 **Two millions**

Compare the numbers. Use < or >.

15. 430 **>** 426
16. 8,367 **>** 2,967
17. 3,120 **<** 3,140

Write the numbers in order from least to greatest.

18. 287 **191** **375**
19. 381 **376** **386** **465**
20. 2,629 **2,734** **1,614**

### Posttest Chapter 2

Round to the nearest ten.

21. 55 **60**
22. 243 **240**

Round to the nearest hundred.

23. 410 **400**
24. 2,681 **2,700**

Round to the nearest thousand.

25. 8,197 **8,000**
26. 4,793 **5,000**

Use this table to solve each problem.

Name of county	Population	Land area in square miles
Pender	856	2,843
Pender	1,365	9,042

27. Find the population of Pender County to the nearest hundred. **1,400**
28. Which of the two counties shown has the greater land area? **Pender**

Choose the most sensible answer.

29. The smallest class in Butler School has 22 students. How many students are in the largest class? **30**
30. The 2 fourth-grade classes went on a field trip. How many students went? **60**



# CHALLENGE

## Billions

To breathe *one billion* times, you would have to live to be about 100 years old.

billions	hundred-millions	ten-millions	millions	hundred-thousands	ten-thousands	thousands	hundreds	tens	ones
1	0	0	0	0	0	0	0	0	0

**1,000,000,000** ← Standard form

These facts show about how much one billion really is.

- 1,000,000,000 days is about 2,737,909 years.
- 1,000,000,000 hours is about 114,080 years.
- 1,000,000,000 minutes is about 1,901 years.
- 1,000,000,000 seconds is about 31 years, 8 months, 8 days.

Write each number in standard form.

1. The population of the world is about four billion, six hundred million people.  
**4,600,000,000**
2. Light travels at a speed of about sixteen billion, ninety-six million miles per day.  
**16,096,000,000**
3. The United States produces about one hundred thirty billion gallons of oil per year.  
**130,000,000,000**
4. The United States produces about six billion, two hundred eighty million pounds of cotton per year.  
**6,280,000,000**
5. The United States produces about eight billion, two hundred million, nine hundred fifty thousand bushels of corn per year.  
**8,200,950,000**
6. The world produces about nine hundred thirteen billion, eight hundred million gallons of oil per year.  
**913,800,000,000**

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## Challenge

One billion is shown both in a place-value chart and as a number written in standard form.

In Exercises 2, 3, and 6, students must extend the chart to show the entire billions period.

Discuss the idea that there is no "largest number." Given a number, adding 1 will always result in a greater number. Students might enjoy learning the word *googol*, meaning the number expressed by writing the digit 1 followed by 100 zeros.

### Answers, page 25

Answers will vary. Samples are given.

1. By grouping; making a tally; counting individually; having each person count part of the beans
2. By using tally marks; drawing groups of beans; using a different way to write numbers
3. When you need to keep track of small numbers; when you want to keep a running count
4. When the total is known; when you need to write large numbers; to compute with numbers
5. The digits are in different places; the number with the greater digit in the tens place is the greater number.
6. The digits are the same; they are both two-digit numbers.

7. Finding the greatest three-digit number out of 4 spins means that students should place the greatest digit in the hundreds place, the next greatest digit in the tens place, and the third greatest digit in the ones place. Sometimes two or all three of the digits can be equal.

### Answers, page 45

16. 5 ten-thousands
17. 5 millions
18. 5 hundred-millions
25. Ninety-nine million, nine hundred ninety-nine thousand, nine hundred ninety-nine



## Using Problem-Solving Strategies

- Use logical reasoning.
- Make a table.

### Introduction

This problem-solving lesson utilizes logical thinking and making a table to determine the ownership of pet cats.

### Using the Page

Have the class read through the lesson. Then ask questions to encourage the students to *use logical reasoning* and to make sure they understand the problem. "If a person can't own a cat whose name begins with the same letter as their own name, which one can't Barbara own?" [Bingo]

Problem 1, "Who owns Juggles?", can be answered by reading the clues. [Lynn] Students should *make a table* to record this information. List all the names of the owners and the names of the cats in the table. Since Lynn owns Juggles, put a circle in the box under Lynn's name and in line with the cat Juggles. Then put an X in the remaining boxes in line with the cat Juggles and the boxes under Lynn's name.

	Janice	Barb	Lynn	Margaret
Juggles	X	X	O	X
Bingo			X	
Lovey			X	
Muff			X	

For Problem 2, Janice cannot own Muff because the problem states, "Janice doesn't know Muff's owner." Margaret cannot own Muff because, "No one owns a cat whose name begins with the same letter . . ." Put an X in the appropriate boxes in the table. [(Muff, Janice), (Muff, Margaret)]

For Problem 3, Barbara must be the owner of Muff since she is the only one left. Place a circle under Barbara's name and in line with the cat Muff. Place an X in the remaining boxes under Barbara's name.

In Problem 4, Margaret cannot own Bingo because, "Bingo's owner is best friends with Margaret." Put an X in the appropriate box in the table. Place a circle in the box (Lovey, Margaret) and an X in the box (Lovey, Janice).

Have students examine the table for Problem 5. The logical choice according to the clues and remaining choices is that Janice owns Bingo. Place a circle in the appropriate box.

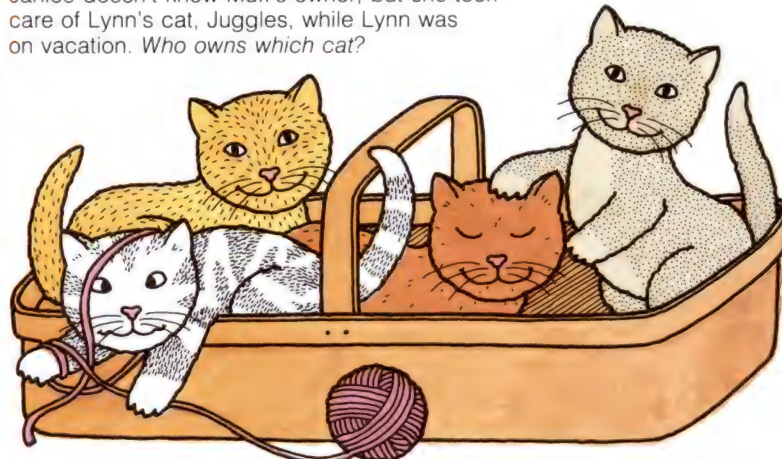
## Using Problem-Solving Strategies

### CAT PUZZLE

Janice, Barbara, Lynn, and Margaret each own a cat. The cats' names are Juggles, Bingo, Lovey, and Muff.

Each of the cats has a name that begins with a letter different from the first letter of its owner's name.

Bingo's owner is one of Margaret's best friends. Janice doesn't know Muff's owner, but she took care of Lynn's cat, Juggles, while Lynn was on vacation. *Who owns which cat?*



1. Who owns Juggles? **Lynn**
2. Can Janice own Muff? **No** Can Margaret? **No**
3. Who owns Muff? **Barbara**
4. Can Margaret own Bingo? **No**
5. Who owns Bingo? **Janice**
6. Who owns which cat? **See margin.**

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.

**PROBLEM-SOLVING STRATEGIES**

- DRAW A PICTURE
- MAKE A TABLE
- USE PHYSICAL MODELS
- USE LOGICAL REASONING
- WORK BACKWARD



50

This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

To complete Problem 6, students only need to check the table to see which owner and cat have been matched.

### Answers

6.	Janice	Barb	Lynn	Margaret
Juggles	X	X	O	X
Bingo	O	X	X	X
Lovey	X	X	X	O
Muff	X	O	X	X

Maintenance; Choosing a Computation Method, p. 399



## Mathematical Background

**Estimation** An *algorithm* is a step-by-step procedure for finding an answer to an arithmetic problem, but an estimate can first be obtained to see if the answer is reasonable. One method of estimating a sum is to round the numbers.

Consider the addition problem  $2,893 + 1,207$ : If each addend is rounded to the nearest thousand, the problem would be  $3,000 + 1,000$ , and the estimated sum would be 4,000. If the answer obtained with the regular algorithm is about 4,000, then one would have greater confidence in that answer. If this were a subtraction problem and the same rounding was used, then the estimated difference would be 2,000.

**Addition** To add using the usual algorithm, the digits must be renamed whenever there is a sum of 10 or more. Consider the addition problem  $298 + 654$ . If written with the place values noted, it is:

	h	t	o
	2	9	8
+ 6		5	4
	8	14	12

The sum would contain 8 hundreds, 14 tens, and 12 ones. The 12 ones are renamed as 1 ten and 2 ones, which means there are now 15 tens. These are renamed as 1 hundred and 5 tens, leaving 9 hundreds, or a sum of 952.

**Subtraction** The subtraction algorithm uses the same mathematical principle of renaming, but for subtraction, digits are renamed in terms of smaller units whenever necessary. Consider the subtraction  $534 - 259$ . Written in vertical form it is:

	h	t	o
	5	3	4
- 2		5	9

Because the 9 cannot be subtracted from the 4, the 34 in 534 is renamed as 2 tens and 14 ones. The 9 can then be subtracted. Completely renamed, the problem is written:

	h	t	o
	4	12	14
- 2		5	9
	2	7	5

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## Pretest for Chapter 3

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 3**

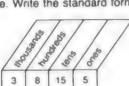
Estimate each answer. First round both numbers to the nearest ten.

1.  $58 + 21$       2.  $78 - 32$

Estimate each answer. First round both numbers to the nearest hundred.

3.  $518 + 283$       4.  $936 - 262$

Rename. Write the standard form.


5. 

Add.

6.  $468 + 15$       7.  $2409 + 1521$       8.  $388 + 275$

9.  $4466 + 3915$       10.  $4763 + 15$       11.  $483288 + 182$

Rename to show 10 more tens.

12. 

1. 80

2. 50

3. 800

4. 600

5. 3,955

6. 483

7. 3,930

8. 663

9. 8,381

10. 125

11. 933

12. 118

13. 6289

Name \_\_\_\_\_

**Pretest Chapter 3**  
continued

Subtract

13.  $46 - 27$       14.  $835 - 309$       15.  $6308 - 4390$

16.  $445 - 257$       17.  $701 - 342$       18.  $6005 - 3478$

Check each answer. Tell whether it is right or wrong. If it is wrong, give the correct answer.

19.  $5438 - 1761 = 3677$       20.  $686 + 405 = 1011$

Add or subtract.

21.  $5868 - 592$       22.  $52842 + 3258$

Write an equation. Then find the answer.

23. Aaron bought a camera for \$98.89, and a case for \$12.98. How much did he spend in all?  
23.  $98.89 + 12.98 = n$   
 $n = \$111.87$

24. It is 1,047 miles from Chicago to Denver. It is 1,261 miles from Denver to San Francisco. How much farther from Denver is it to San Francisco than to Chicago?  
24.  $1,047 + 1,261 = n$   
 $n = 2,308$   
214 miles

25. It is 618 miles from Atlanta to Washington and 237 miles from Washington to New York. How far is it from Atlanta to New York through Washington?  
25.  $618 + 237 = n$   
 $n = 855$   
855 miles



# Teaching Chapter 3



## Problem Solving

**Five-Step Method** The five-step method of problem solving, introduced in Chapter 1, is reinforced in this unit with another problem-solving lesson that focuses on the PLAN step.

**Problem-Solving Strategies** The lesson on pages 82–83 introduces a new strategy, *Write an equation*. The nonroutine problems in the *Using Problem-Solving Strategies* feature on pages 74–75, 86, 414, and 415 give students an opportunity to use additional strategies including *Solve a simpler problem*, *Find a pattern*, *Try and check*, and *Use physical models*.

When you provide students with physical models with which to solve problems, it's a good chance to experiment with and explore these concrete materials along with the students. Providing a role model for the students helps develop a positive classroom atmosphere.

Help students to understand that problem solving sometimes is more difficult and time-consuming than rote skills. Before students attempt the *Apply* word problems for each objective, remind them that these problems will probably require more time to complete than the *Try* and *Practice* problems.



## Calculators and Computers

**Calculators** In *Additional Resource 27*, students use a calculator to investigate patterns and give the rule for finding missing numbers. It is a good idea to allow students to work on their own as they use a calculator to explore relationships between numbers. Encourage any students who are having difficulty, to stop and explain their strategies as they work. If these students need a hint, have them use the calculator to find differences between pairs of consecutive numbers. Make sure they write each difference below each pair of numbers. This should help them find the rule and complete the pattern.

**Using a Calculator in Problem Solving** Students need to compute to solve word problems in this chapter. Whenever you allow students to use a calculator, it permits them to focus on the problem-solving process, without causing them to worry about computational procedures.

**Computers** In this chapter, students continue to explore the PRINT statement, testing ways to use the computer as a calculating device for the operations of addition and subtraction.



## Estimation and Mental Math

**Estimation** In this chapter, students estimate sums and differences by *rounding*. To discourage them from performing the actual computations first and rounding the results, it is a good idea to have students begin by rounding each addend, writing that number on their papers, and finding the estimated sum. Once you are sure students have mastered the procedure, have them perform the rounding and estimating mentally.

On page 52 students will be introduced to the estimation owl. This owl will appear from time to time throughout the book to remind students to estimate when they calculate.

**Mental Math** In *Additional Resource 21*, students use *compensation*—add 9 to a number by adding 10 and then subtracting one. *Additional Resource 32* extends the strategy to subtracting 9. Compensation is extended on page 85, where students add a number close to 100—say, 98—by adding 100 and then subtracting the appropriate number—in this case, 2. This strategy is also used for subtraction.

In *Additional Resources 23* and *28*, students add and subtract *special numbers*—multiples of 10. Also, page 85 discusses *breaking apart numbers*, adding the tens and ones separately, and then adding those sums.

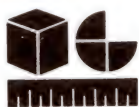
After students have been exposed to these mental math strategies, they should be encouraged to use the strategies with which they feel the most comfortable. It is not important for students to be able to decide which mental math strategy is best for a particular exercise. It is important for them to experience success using whatever strategy they employ.



Exact numbers are not always needed. Often an estimate is all that is required.



For a general overview of these topics, see pages 436–485.



## Concrete Materials

Using concrete materials is an excellent way to learn the concept of renaming. Too often, students learn how to add only by rote, with little or no understanding of why a number is renamed. The previous work on place value should have helped students see that 1,436 is actually 1 thousand, 4 hundreds, 3 tens, and 6 ones.

If students still do not have a firm grasp of renaming concepts, have them work on this concept before you expand it to renaming in addition or subtraction.

To help students see the necessity for renaming when doing addition, suggest that they use place-value boxes with the counters. For each exercise, the students must first display the given numbers with units, tens, hundreds, and thousands. Upon combining the counters in each place, students will see a need to trade some units for tens, and/or some tens for hundreds, and/or some hundreds for thousands.

To enable students to understand the necessity for renaming when doing subtraction, students can use place-value charts and counters to display the minuend of the exercise. Unlike addition, the second number is not displayed when doing subtraction. Instead, that number of counters is removed from the original number.



## Thinking Skills

This chapter does more than teach thinking skills related to **following rules and procedures** for estimation and computation. The teaching examples and the activities in the lesson notes help students **comprehend concepts** by explaining why those rules work. Students **apply concepts** when they solve problems which require *choosing the operation and writing an equation*. The *Using Problem-Solving Strategies* features involve **analyzing relationships**. Page 414 helps students **make generalizations** by having them *find a pattern and solve a simpler problem*.



Be smart.  
Estimate when  
you calculate.

This owl reminds students to estimate and gives students estimation strategies.



## Teaching Techniques

**Questioning and Responding** When students give the answer to an addition or subtraction word problem, before you indicate whether the answer is right or wrong, sometimes ask them to explain how they knew which operation to pick. Encourage explanations that describe the action in the problem—for example, joining, separating, comparing. This will promote class discussion, and will let you know whether the students really understand or are just guessing.

**Helping Students Read and Write Mathematics** When students read examples of computation in this chapter, remind them to read from right to left (work with the ones first). This may help prevent some of the common errors students make due to computing from left to right. As students copy exercises that are in horizontal form and rewrite them in vertical form, remind them to check that the digits in the ones column on the right are lined up correctly.

**Teaching Students with Special Needs** When low achievers and special-education students try to do computation, their memory deficiencies cause them to have problems. The students may have trouble remembering particular steps in the computational procedure or recalling the sequence of steps. Have students verbalize what they're doing, so you'll know where they're at in their thinking and where they're having trouble. The learning-disabled students may not be able to write what they see or hear; they may leave out or reverse digits. If you use color coding or underlining, it will help them focus their attention on particular parts of the problem.

Gifted students often enjoy looking for number patterns. Pascal's triangle, which incorporates interesting number patterns, is used in several mathematics applications. Your students may enjoy reading about Pascal to learn some uses of the triangle. After they identify the patterns discussed in **Enrichment 24**, encourage them to find the number patterns in the diagonals. The first and second diagonals are obvious; the rest, however, follow more complicated configurations. You can challenge your students to identify each pattern and extend the diagonals.

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

**Music:** school chorus (56–57), school band (58–59)

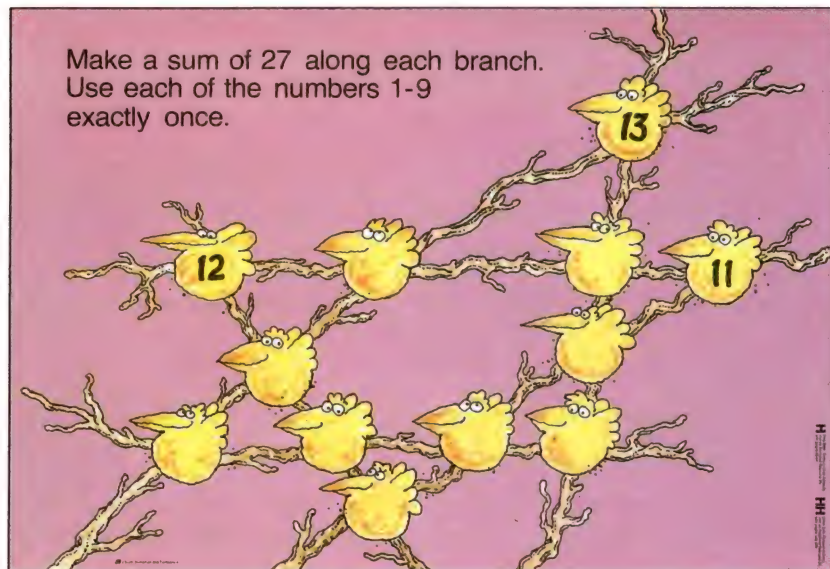
**Science:** endangered species (64–65)

**Social Studies:** presidents (72–73), pony express (82–83)

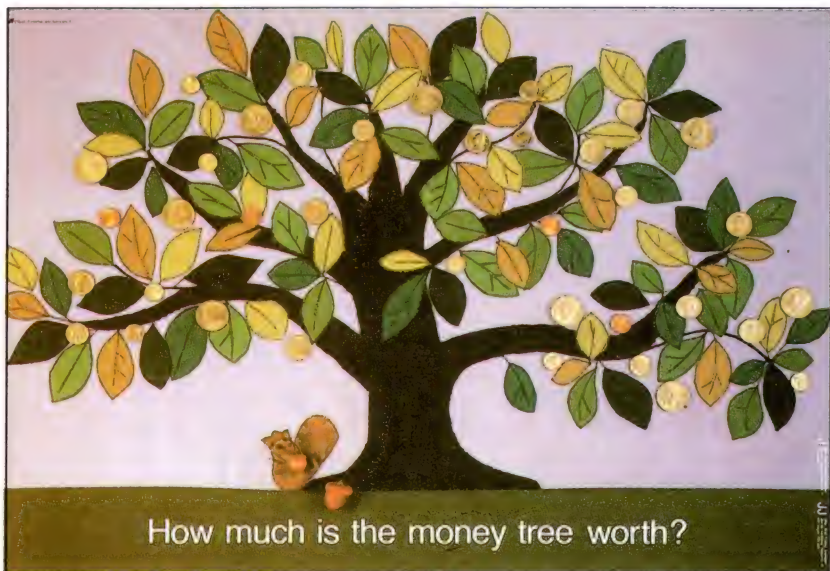


## Bulletin Board Suggestions

The posters shown here can be used with Chapter 3. Please note that although Math Poster G is not shown here, it can also be used with this chapter. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster H



Math Poster J



Math Poster I

## Materials Chapter 3

- Number lines (Teaching Aid A) 52–53, 60–61, 64–65
- Hundreds, tens, units (Punchouts or Math Kit) 54–61, 70–73
- Place-value charts (Teaching Aid C) 54–57, 66–67, 72–73
- Computation squares (Teaching Aid D) 56–57, 68–69
- Number cubes (Punchouts or Math Kit) 60–61, 80–81
- Chalk 62–63
- Calculators (1 per team) 62–63
- Common objects 66–67, 72–73, 78–79
- Play money: \$100, \$10, \$1 66–69, 80–81
- Cards (blanks to make a number game) 66–67
- 10 cards (0–9) 70–71
- Colored chips or other counters 74–75
- Money (Punchouts) 78–79, 86
- Merchandise catalogs 78–79
- Toy car 86



### Basic Situation

Display Poster J at this time and ask students to estimate the number of leaves on the tree. Ask students to suggest various methods to find an approximate answer. Then have students participate in an Estimation Olympiad. Have students work individually and in groups to estimate various numbers of objects or measures, and then compare their estimates to the actual number or measure. (See *Suggested Procedures*.)

### Possible Problems

- How many buttons are in a jar?
- How long is the thread on a spool?
- How many paper clips could be placed end-to-end across the length of the room?
- How many times would a spool roll across the width of the room?
- How many popcorn kernels are in a jar?

### Indicators of Success

Watch for the strategies that individuals or groups use to make the estimates.

Students might test their estimates by making partial measurements or counts.

If students have an opportunity to find the scores for the first events before completing all estimates, they may find that their scores are becoming lower as they become better estimators.

### Ways to Help

Encourage students to share ideas and to discuss possible strategies before deciding how to make an estimate.

If students have trouble estimating, ask some leading questions like: How many would fit in your hand? How many could be placed in a foot or, if the floor is tiled, across one tile?

Refer students to page 70 on subtraction if they have difficulty finding the difference between the estimates and the actual amounts or to page 60 on addition to help find the total score.

$$26 + 8 = 34$$



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

### Suggested Procedures

Students might make the estimates individually first, then work in small groups to determine a group estimate. After the groups have arrived at estimates, they might use the specified materials to determine a more exact answer. You may want to provide the number of buttons and the number of

popcorn kernels in the jars.

Students may want to determine a score for the Estimation Olympiad by subtracting the estimate from the actual amount or measure for each event and adding these differences.

Students might organize their work by using the following chart.

Event	Actual Amount or Measure	My Estimate	Amount Over/Under	Group Estimate	Amount Over/Under



## Objective 20

Estimate the sum of two numbers and add numbers with up to four digits with no renaming.

### Lesson Theme

School Activities: Enrollment

### Materials

- Number lines (Teaching Aid A)

## Introduction

Discuss the use of estimates when exact counts are impossible [number of fish in the sea] or when an approximate number is all that is needed [attendance at a ball game].

**Warm-Up Review** Round to the nearest ten: 34, 573 [30, 570]. Round to the nearest hundred: 660, 4,335 [700, 4,300]. Round to the nearest thousand: 7,098, 2,811 [7,000, 3,000].

**Motivational Situation** Pose the following problem to the students. Suppose you are the principal of a school. Why would it be important to know how many students are enrolled? [For hiring teachers, ordering books, desks, or other materials]

## Using the Pages

**Teach** Read and work through each example. Discuss that a two-digit number can be rounded to the tens place, a three-digit number to the hundreds place, and a four-digit number to the thousands place. Point out to students that when they estimate the sum of a two-digit number and a three-digit number, both numbers should be rounded to the tens place. Ask students to what place each number should be rounded when they are estimating the sum of a four-digit number and a three-digit number. [The hundreds place] The owl logo appears frequently throughout the student's text to remind students to estimate. Other teaching examples:

$$531 + 42 \quad [530 + 40 = 570]$$

$$3,265 + 2,714 \quad [3,000 + 3,000 = 6,000]$$

**Try Error Analysis** In Exercise d, watch for students who have difficulty rounding when the number of digits in each number is not equal. Remind students who make this error that they should use the number with fewer digits when deciding to which place they should round.

**Practice** Have students check their estimated sums by finding the actual sums. You might want to have students write a sentence using the actual sum, the estimated sum, and either  $<$  or  $>$ . (Continued on page 53.)

## Estimating Sums: Mental Math

- A.** There were 476 students at Lakeview School in 1955. There are now 113 more students at Lakeview than in 1955. About how many students are at Lakeview now?

Estimate  $476 + 113$ .

$$476 + 113$$

$$\begin{array}{r} 476 \\ + 113 \\ \hline 500 + 100 = 600 \end{array}$$



Be smart.  
Estimate when  
you calculate.

Round 476 and 113  
to the nearest hundred.  
Then add.

There are about 600 students at Lakeview now.

Actual sum

$$\begin{array}{r} 476 \\ + 113 \\ \hline 589 \end{array}$$

- B.** Estimate each sum to the nearest thousand.

$5,530 + 2,641 = 8,171$  (Both numbers are rounded up.) Actual sum: 8,171

$5,430 + 2,341 = 7,771$  (Both numbers are rounded down.) Actual sum: 7,771

$5,530 + 2,341 = 7,871$  (One number is rounded up. One number is rounded down.) Actual sum: 7,871

**Try Estimation** Estimate each sum. First round both numbers to the given place.

- a.  $56 + 47$  (nearest ten) **110**  
b.  $314 + 525$  (nearest hundred) **800**  
c.  $7,305 + 1,671$  (nearest thousand) **9,000**  
d.  $2,376 + 542$  (nearest hundred) **2,900**

**e. CALCULATOR** Use your calculator to find the actual sums for Exercises a–d. Compare each actual sum with its estimated sum. What can you say about the actual sum of two numbers and their estimated sum **See margin.**

- if both numbers are rounded up to get the estimated sum?
- if both numbers are rounded down to get the estimated sum?
- if one number is rounded up and the other is rounded down to get the estimated sum?



52

## Practice 20

Estimate each sum. **Actual sums are in parentheses.** P20

First round both numbers to the nearest ten

1.  $21 + 8 = 29$  (29)  
2.  $51 + 17 = 68$  (68)  
3.  $35 + 22 = 57$  (57)

4.  $73 + 46 = 119$  (119)  
5.  $111 + 26 = 137$  (137)  
6.  $92 + 57 = 149$  (149)

First round both numbers to the nearest hundred

7.  $504 + 115 = 619$  (619)  
8.  $315 + 423 = 738$  (738)  
9.  $513 + 7,220 = 7,733$  (7,733)

10.  $654 + 231 = 885$  (885)  
11.  $1,313 + 581 = 1,894$  (1,894)  
12.  $108 + 410 = 518$  (518)

First round both numbers to the nearest thousand

13.  $4,351 + 3,118 = 7,469$  (7,469)  
14.  $5,724 + 2,012 = 7,736$  (7,736)  
15.  $3,809 + 2,190 = 6,000$  (6,000)

16.  $6,775 + 2,113 = 8,888$  (8,888)  
17.  $4,251 + 2,789 = 7,040$  (7,040)  
18.  $6,823 + 1,151 = 7,974$  (7,974)

Solve the problem. Then estimate to see if your answer is reasonable. Estimate is in parentheses.

19. Last summer, 3,801 people attended the circus in Macison. This summer 1,890 more people attended. How many people went to the circus this summer?  
**5,691 (6,000)**

## Reteaching 20

Estimate  $12 + 17$ . R20

Round each addend to the nearest ten.  
 $10 + 20 = 30$  Add

**Rounding Reminder**  
Touch the digit in the place you are rounding to. Circle the digit to the right. If the digit you circled is 5 or greater, round up. If it is less than 5, round down.

Estimate by rounding to the nearest 10. Then add.

1.  $21 + 11 = 32$   
2.  $51 + 17 = 68$   
3.  $36 + 22 = 58$

4.  $66 + 22 = 88$   
5.  $14 + 25 = 39$   
6.  $33 + 56 = 89$

Estimate by rounding to the nearest 100. Then add.

7.  $504 + 115 = 619$   
8.  $317 + 421 = 738$

9.  $687 + 102 = 789$   
10.  $457 + 322 = 779$



## Assignment Guide

basic 1–10, 11–27 odd  
average 1–27  
enriched 1–28

**More Practice Set 20,**  
**page 359**

(Continued from page 52.)

**Apply Problem Solving** Students improve their problem-solving skills by restating the problems in their own words. This will be helpful in Problem 28, since the second addend must be inferred.

## Follow-Up

**Reteaching** Students having difficulty rounding numbers should use number lines to help them work the exercises. Have students draw their own number lines showing multiples of 10 on the board and then round several numbers such as 34, 78, and 57. Have students explain their work. Repeat with multiples of 100 and 1,000.

**Enrichment** Have students gather information on the number of students in each class. Round and add (with a calculator) to get an estimate of school population. Then have them add actual class sizes (again with a calculator) to get the exact school population. Compare the rounded and exact numbers.

## Calculator

Select the best estimate for each sum, then check using a calculator.

- 6,719 + 3,257 + 2,013 + 4,462 =  
15,000 16,000 17,000 18,000  
[16,000]
- 7,496 + 1,237 + 5,749 + 6,538 =  
19,000 20,000 21,000 22,000  
[21,000]
- 3,618 + 4,924 + 6,116 + 8,980 =  
23,000 24,000 25,000 26,000  
[24,000]

## Computer Assisted Instruction

Mathematics Courseware Series  
• Addition and Subtraction 3, Activity 1

## Daily Maintenance

Tell what each 3 means.

- 8,035 [3 tens]
- 4,308 [3 hundreds]
- 73,622 [3 thousands]
- 130,568 [3 ten-thousands]
- 503,741,982 [3 millions]
- 629,348,570 [3 hundred-thousands]

**Answers, pages 52–53**

**See page 85 of this Teacher's Edition.**

**Practice Estimation** Estimate each sum. **Actual sums are in parentheses.**

First round both numbers to the nearest ten.

- |                       |                       |                       |                          |                           |
|-----------------------|-----------------------|-----------------------|--------------------------|---------------------------|
| 1. 12 + 17<br>30 (29) | 2. 31 + 22<br>50 (53) | 3. 68 + 21<br>90 (89) | 4. 51 + 42<br>90 (93)    | 5. 45 + 37<br>90 (82)     |
| 6. 41 + 26<br>70 (67) | 7. 27 + 42<br>70 (69) | 8. 58 + 29<br>90 (87) | 9. 528 + 21<br>550 (549) | 10. 82 + 312<br>390 (394) |

First round both numbers to the nearest hundred.

- |                            |                            |                                  |                                  |
|----------------------------|----------------------------|----------------------------------|----------------------------------|
| 11. 671 + 218<br>900 (889) | 12. 452 + 113<br>600 (565) | 13. 529 + 410<br>900 (939)       | 14. 602 + 325<br>900 (927)       |
| 15. 238 + 311<br>500 (549) | 16. 213 + 284<br>500 (497) | 17. 503 + 2,310<br>2,800 (2,813) | 18. 1,636 + 252<br>1,900 (1,888) |

First round both numbers to the nearest thousand.

- |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|
| 19. 6,242 + 2,731<br>9,000 (8,973) | 20. 4,175 + 1,214<br>5,000 (5,389) | 21. 7,865 + 1,132<br>9,000 (8,997) |
| 22. 2,006 + 6,482<br>8,000 (8,488) | 23. 2,345 + 5,132<br>7,000 (7,477) | 24. 2,468 + 3,531<br>6,000 (5,999) |

25. For Exercises 1–10, write whether you think the actual sum will be *greater than* or *less than* the estimated sum. If you cannot tell, write *cannot tell*. Explain your reasoning to another student. **See margin.**

**Apply Estimation** Solve each problem by finding the actual answer. Then estimate to see if your answer is reasonable.

26. Clark School's cafeteria served 165 hot lunches and 432 sandwich plates. How many meals were served in all?  
**597 meals** ( $200 + 400 = 600$ )
27. At Lakeview, 202 milk tickets were sold. 37 more lunch tickets than milk tickets were sold. How many lunch tickets were sold?  
**239 tickets** ( $200 + 40 = 240$ )
28. Bus A travels 21 miles each morning picking up students for Clark Middle School. In the afternoon, it follows the same route. Find the total number of miles Bus A travels each day.  
**42 miles** ( $20 + 20 = 40$ )

**More Practice Set 20, page 359 53**

## Enrichment 20

Name \_\_\_\_\_ E20

**Clowning Around**

Without finding the exact answers, choose the best estimate from the list on the right.

1. 11 + 60 _____	2. 26 + 53 _____	3. 601 + 115 _____	4. 3,541 + 2,418 _____	5. 260 + 317 _____	6. 15 + 24 + 30 _____	7. 523 + 120 _____	8. 852 + 6,145 _____	9. 671 + 128 _____	10. 287 + 201 + 110 _____	11. 22 + 25 + 12 _____
------------------	------------------	--------------------	------------------------	--------------------	-----------------------	--------------------	----------------------	--------------------	---------------------------	------------------------

Estimates

A 60	B 70	C 80	E 600	F 700	H 800	T 6,000	W 7,000	Z 8,000
------	------	------	-------	-------	-------	---------	---------	---------

Use your answers to complete these sentences.

The drummer had the E A T.  
1 10 11 4

The garden had the B E E T.  
6 5 7 4

The clown had the F E E T.  
3 5 7 4

The sun had the H E A T.  
9 5 11 4

The canary had the T W E E T.  
4 8 5 10 4

The player tried to C H E A T.  
2 9 5 11 4

## Additional Resource 20

Name \_\_\_\_\_ Additional Resource 20

**Maintenance**

Write the hundreds digit.

1. 437 <u>4</u>	2. 71,058 <u>0</u>	3. 594,217 <u>2</u>
-----------------	--------------------	---------------------

Write the thousands digit.

4. 1,234 <u>1</u>	5. 69,438 <u>9</u>	6. 8,457,236 <u>7</u>
-------------------	--------------------	-----------------------

Write the millions digit.

7. 3,452,768 <u>3</u>	8. 5,247,031 <u>5</u>	9. 1,452,763 <u>1</u>
-----------------------	-----------------------	-----------------------

Write each number in standard form.

10. eighty thousand, four hundred <u>80,400</u>	11. two hundred thirty-four thousand <u>234,000</u>	12. one million, forty-seven <u>1,000,047</u>
13. nine million, eighty thousand, five hundred <u>9,080,500</u>	14. four hundred million, six hundred <u>400,000,600</u>	

Write the number that is 1,000 greater.

15. 7,538 <u>8,538</u>	16. 6,534 <u>7,534</u>
17. 596 <u>1,596</u>	18. 1,800 <u>2,800</u>
19. 98,999 <u>99,999</u>	



## Objective 21

Rename a number with up to four digits when the number of ones, tens, or hundreds is greater than 9.

### Vocabulary

Rename, standard form

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Place-Value Charts (Teaching Aid C)

## Introduction

**Using Concrete Materials** Have each student count out 2 ten-sticks and 15 unit-squares. Ask students if there are enough unit-squares to make a ten-stick [Yes]. Have students trade 10 unit-squares for 1 ten-stick. Tell students that 15 ones make 1 ten 5 ones. So they now have 3 tens and 5 ones.

Use objects to review grouping by tens: 10 ones = 1 ten, 10 tens = 1 hundred, 10 hundreds = 1 thousand.

Ask students what each digit in 576 means. [5 hundreds 7 tens 6 ones] Then write 576 in a place-value chart on the board.

## Using the Pages

**Teach** Read and discuss the example. As you work through each step of the renaming, write it on the board.

Other teaching examples:

4 tens 13 ones [53]

5 hundreds 32 tens 6 ones [826]

2 thousands 24 hundreds 5 tens

9 ones [4,459]

**Try Error Analysis** In Exercise c, watch for students who rename only once. Point out that whenever the sum is 10 or more in any given place, the number needs to be renamed. (See Reteaching 21.)

**Practice** Exercise 10 requires two renamings. Exercise 12 requires three consecutive renamings to give the standard form.

**Apply Problem Solving** Students improve their problem-solving skills by demonstrating their work with objects.

**Use physical models** Have students use base ten blocks to demonstrate Problem 13. For Problem 14, have students use counters to help them find a rule. Students can model the first number in the sequence and note which operation is performed as they model each subsequent number. Students can discover a rule by asking themselves questions, such as, how many unit-squares were taken away? How many were added?

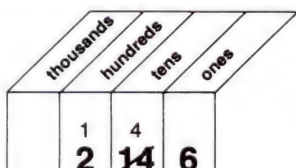
## Renaming for Addition



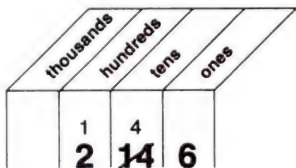
Rename 2 hundreds 14 tens 6 ones. Write the standard form.



Use 10 tens to make 1 more hundred. 4 tens are left.



Combine the hundreds.



**346** ← Standard form

54

## Practice 21

Name \_\_\_\_\_ P21

Rename. Write the standard form.

- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           | 4        | 36   |      |

  
**73**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           | 5        | 23   |      |

  
**517**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           | 3        | 21   | 7    |

  
**5361**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 6         | 38       | 1    | 3    |

  
**9,813**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 7         | 2        | 18   |      |

  
**738**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 2         | 33       | 6    | 1    |

  
**5,361**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 3         | 2        | 25   | 6    |

  
**3,456**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 3         | 15       | 6    | 4    |

  
**4,564**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 1         | 2        | 34   | 5    |

  
**1,545**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 5         | 1        | 3    | 28   |

  
**5,158**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 6         | 33       | 5    |      |

  
**935**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 4         | 8        | 6    | 31   |

  
**4,891**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 5         | 16       | 3    | 28   |

  
**6,658**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 7         | 38       | 2    |      |

  
**1,082**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 3         | 9        | 6    | 26   |

  
**3,986**

## Reteaching 21

Name \_\_\_\_\_ R21

Rename 2 tens and 14 ones. Give the standard form.

14 = 1 ten + 4 ones

Standard Form → 3 4

Rename. Give the standard form.

- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          | 2    | 14   |

  
**24**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          | 4    | 12   |

  
**412**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          | 1    | 18   |

  
**118**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          | 3    | 2    |

  
**32**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          | 4    | 39   |

  
**439**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
|           |          | 2    | 12   |

  
**212**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 2         | 1        | 7    | 6    |

  
**2,176**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 2         | 6        | 28   | 1    |

  
**2,881**
- | thousands | hundreds | tens | ones |
|-----------|----------|------|------|
| 8         | 4        | 1    | 19   |

  
**8,449**



## Assignment Guide

basic 1–10, 13–14  
average 1–11, 13–14  
enriched 1–14

**More Practice Set 21,**  
page 359

## Follow-Up

**Extra Practice** Have students write numbers through the thousands that you specify in a place-value chart, and then have students give the standard form. For example:

5 tens 25 ones [75]

3 hundreds 18 tens 6 ones [486]

## Reteaching Using Concrete Materials

Have students represent each exercise with objects or base-ten blocks. Have them show the regrouping and record the renaming in a place-value chart.

**Enrichment** Give students various numbers in standard form and have them write several different names for each number. For example, for the number 592, some of the names students might write include:

4 hundreds 19 tens 2 ones

3 hundreds 29 tens 2 ones

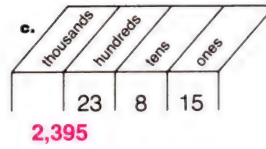
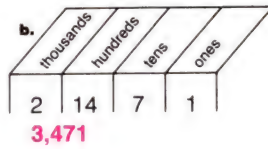
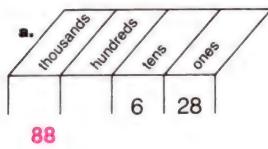
2 hundreds 39 tens 2 ones

5 hundreds 8 tens 12 ones

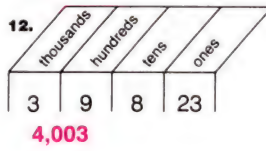
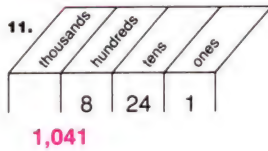
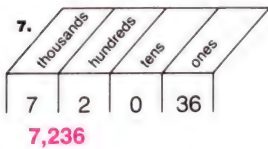
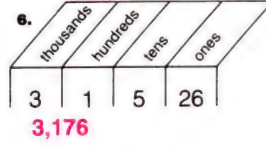
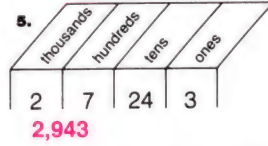
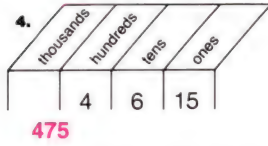
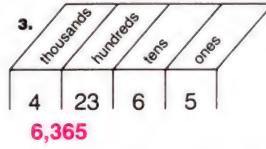
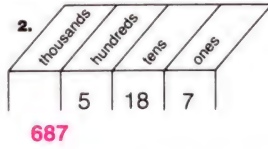
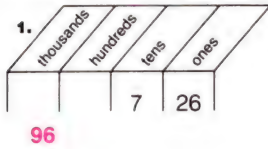
5 hundreds 7 tens 22 ones

59 tens 2 ones

**Try** Rename. Write the standard form.



**Practice** Rename. Write the standard form.



**Apply** Solve each problem.

13. There are 3 boxes of 100 pens, 14 packs of 10 pens, and 5 single pens on the shelf. How many pens are on the shelf?

**445 pens**

14. **Write a problem.** Tom started with 6. He used the rule "add 5" to get 6, 11, 16, 21. Start with a number, make a rule, list the numbers, and have another student discover the rule.

**Answers will vary.**

Using Problem-Solving Strategies, page 414  
More Practice Set 21, page 359 **55**

## Enrichment 21

Name \_\_\_\_\_ E21

**Some Addition Puzzles**

Write the numbers 3–8 in the circles so that each connected pair of digits has a different sum. There is more than one way to do it. Here is one way.

Write the given numbers in the circles so all sums are different. **Answers may vary.**

1. Use 1–6.

5	1	3
4	6	2

2. Use 4–9.

4	5	6
8	9	7

3. Use 1–9.

1	2	3
5	6	4
7	8	9

Write the given numbers in the circles so that all sums are odd. **Answers may vary.**

4. Use 4–9.

4	5	6
7	8	9


5. Use 1–9.

1	2	3
4	5	6
7	8	9

Write the given numbers in the circles so that there are exactly 3 different sums. **Answers may vary.**

6. Use 3–8.

3	7	5
8	4	6



## Additional Resource 21

Name \_\_\_\_\_ Additional Resource 21

**Mental Math Adding Nines**


27 ÷ 9 = 3  
27 ÷ 10 = 2.7  
37 ÷ 1 = 37  
So 27 ÷ 9 = 36.

Add mentally.

1. 35 + 9 = <b>44</b>	2. 53 + 9 = <b>62</b>
3. 18 + 9 = <b>27</b>	4. 26 + 9 = <b>35</b>
5. 74 + 9 = <b>83</b>	6. 62 + 9 = <b>71</b>
7. 89 + 9 = <b>98</b>	8. 37 + 9 = <b>46</b>
9. 135 + 9 = <b>144</b>	10. 146 + 9 = <b>155</b>
11. 253 + 9 = <b>262</b>	12. 244 + 9 = <b>253</b>
13. 387 + 9 = <b>396</b>	14. 312 + 9 = <b>321</b>
15. 108 + 9 = <b>117</b>	16. 284 + 9 = <b>293</b>
17. 549 + 9 = <b>558</b>	18. 626 + 9 = <b>635</b>
19. 326 + 9 = <b>335</b>	20. 868 + 9 = <b>877</b>
21. 38 ÷ 9 + 9 = <b>56</b>	22. 23 ÷ 9 + 9 = <b>93</b>
23. 56 ÷ 9 + 9 = <b>74</b>	

You can add 9 to a number by adding 10 and subtracting 1. Here's how:

10 is 1 too many. So subtract 1.



## Daily Maintenance

Round each number to the nearest ten.

1. 56 [60]

2. 123 [120]

3. 89 [90]

4. 145 [150]

5. 5,063 [5,060]

**Using Problem-Solving Strategies, page 414**



Add two numbers with up to four digits with one renaming.

Music: School Chorus

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Place-Value Charts (Teaching Aid C)

Review renaming for addition.

**Motivational Situation** Pose the following problem to the students. If your family decides to attend a singing concert what costs would be involved? [Tickets, traveling expenses, eating, souvenirs] What do the performers have to decide before doing a concert? [How many songs they would sing, how long the concert would last, expenses, and so on]

**Teach** Before students begin their group work in Example A, refer them to pages 438–441 for a discussion. See the corresponding section on pages 470–473 in this Teacher's Edition.

As each group attempts to formulate the relationship between estimation and reasonableness, suggest that they review how they decided whether or not 1,000 was a reasonable answer. You may want to remind them of the rules for estimating sums. When estimating the sum of two numbers that have the *same* number of digits, they should round the addends to their greatest place. In Example A, both numbers should be rounded to the hundreds place. Ask students what they do when the numbers do not have the same number of digits. [Use the addend with the fewer digits to decide to which place both of the addends should round.] Have them give an example. [For example, to estimate the sum of 1,498 and 218, both addends should be rounded to the hundreds place because 218 is the addend with the fewer digits and it rounds to the hundreds place.]

Before students work Example B, demonstrate how to find the sum of 45 and 27 using place-value materials. Use counters to represent 45 and 27. [4 ten-sticks and 5 units, 2 ten-sticks and 7 units] Then write each number in a place-value box. To add, combine the counters [6 ten-sticks and 12 units], and then add the ones and tens in the place-value box to show the grouping. *(Continued on page 57.)*

For Music Week, 238 students from the Clark School choruses joined 126 students from the Lakeview School choruses for a program of folk songs.

**See *Using the Pages* for a discussion of this example.**

- A.** Is it reasonable to say that there were about 1,000 students in the combined choruses? Explain why or why not.

In this book you will often be asked to work in groups. Turn to pages 438–441 for instructions on group work.

Work in groups of 4 and write a paragraph that explains how estimation can help you decide if an answer is reasonable.

About how many students were in the combined choruses?

300 students

- B.** Exactly how many students were in the combined choruses?

Find  $238 + 126$ .

Add the ones.

Add the tens.

Add the hundreds.

$$\begin{array}{r} 1 \\ 238 \\ + 126 \\ \hline 4 \end{array}$$

Rename 14 ones  
as 1 ten 4 ones.

$$\begin{array}{r} 238 \\ + 126 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 1 \\ 238 \\ + 126 \\ \hline 364 \end{array}$$

There are 364 students in the combined chorus.

Look at your estimate in Example A.

Is 364 students a reasonable answer?

Yes



P22

### Why do you go to school?

To solve the riddle, add Find each answer below. Write the letter for that exercise. Some answers are not used

1. $\begin{array}{r} 54 \\ + 27 \\ \hline \end{array}$	E	3. $\begin{array}{r} 25 \\ + 19 \\ \hline \end{array}$	O	5. $\begin{array}{r} 73 \\ + 28 \\ \hline \end{array}$	C	7. $\begin{array}{r} 68 \\ + 17 \\ \hline \end{array}$	M
<u>81</u>		<u>44</u>		<u>101</u>		<u>85</u>	
5. $\begin{array}{r} 237 \\ + 328 \\ \hline \end{array}$	Y	6. $\begin{array}{r} 456 \\ + 527 \\ \hline \end{array}$	M	7. $\begin{array}{r} 307 \\ + 549 \\ \hline \end{array}$	G	8. $\begin{array}{r} 171 \\ + 445 \\ \hline \end{array}$	U
<u>565</u>		<u>983</u>		<u>856</u>		<u>616</u>	
9. $\begin{array}{r} 1247 \\ + 8519 \\ \hline \end{array}$	T	10. $\begin{array}{r} 1375 \\ + 5418 \\ \hline \end{array}$	N	11. $\begin{array}{r} 3232 \\ + 1490 \\ \hline \end{array}$	D	12. $\begin{array}{r} 5893 \\ + 3072 \\ \hline \end{array}$	T
<u>9766</u>		<u>6793</u>		<u>4722</u>		<u>8965</u>	
13. $\begin{array}{r} 2731 \\ + 8519 \\ \hline \end{array}$	A	14. $\begin{array}{r} 3434 \\ + 825 \\ \hline \end{array}$	C	15. $\begin{array}{r} 463 \\ + 72 \\ \hline \end{array}$	P	16. $\begin{array}{r} 671 \\ + 54 \\ \hline \end{array}$	H
<u>3474</u>		<u>4259</u>		<u>535</u>		<u>725</u>	
17. $\begin{array}{r} 2481 \\ + 81 \\ \hline \end{array}$	O	18. $\begin{array}{r} 553 \\ + 764 \\ \hline \end{array}$	C	19. $\begin{array}{r} 3471 \\ + 39 \\ \hline \end{array}$	T	20. $\begin{array}{r} 468 \\ + 928 \\ \hline \end{array}$	O
<u>2962</u>		<u>1327</u>		<u>3710</u>		<u>1396</u>	

### Because the school

C	A	N	T	C	O	M	
1337	3474	6793	8965	101	2962	483	81
T	O	Y	O	U			
3780	346	467	44	676			

[illegible]



**Try** Work in groups. Add. Explain why your answers are reasonable.

a.  $\begin{array}{r} 43 \\ +19 \\ \hline 62 \end{array}$       b.  $\begin{array}{r} 19 \\ +43 \\ \hline 62 \end{array}$       c.  $\begin{array}{r} 4,825 \\ +2,963 \\ \hline 7,788 \end{array}$       d.  $\begin{array}{r} 3,471 + 286 \\ \hline 3,757 \end{array}$

- e. Compare exercises a and b. What does this show you about adding two numbers? **When adding two numbers, you can add the first number to the second, or add the second to the first. The sum is the same.**

**Practice** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math **Methods** Add. Choose a method to find each answer. Tell which method you used. **may vary.**

**P = paper and pencil, C = calculator, M = mental math, E = estimation**

1.  $\begin{array}{r} 78 \\ +15 \\ \hline 93; P \end{array}$       2.  $\begin{array}{r} 23 \\ +58 \\ \hline 81; P \end{array}$       3.  $\begin{array}{r} 53 \\ +19 \\ \hline 72; P \end{array}$       4.  $\begin{array}{r} 47 \\ +26 \\ \hline 73; P \end{array}$       5.  $\begin{array}{r} 314 \\ +295 \\ \hline 609; P \end{array}$

6.  $\begin{array}{r} 645 \\ +126 \\ \hline 771; P \end{array}$       7.  $\begin{array}{r} 382 \\ +255 \\ \hline 637; P \end{array}$       8.  $\begin{array}{r} 437 \\ +256 \\ \hline 693; P \end{array}$       9.  $\begin{array}{r} 6,513 \\ +2,585 \\ \hline 9,098; P, C \end{array}$       10.  $\begin{array}{r} 2,578 \\ +6,331 \\ \hline 8,909; P, C \end{array}$

11.  $\begin{array}{r} 7,801 \\ +1,557 \\ \hline 9,358; P, C \end{array}$       12.  $\begin{array}{r} 2,632 \\ +1,557 \\ \hline 4,189; P, C \end{array}$       13.  $\begin{array}{r} 628 \\ +91 \\ \hline 719; P \end{array}$       14.  $\begin{array}{r} 372 \\ +85 \\ \hline 457; P \end{array}$       15.  $\begin{array}{r} 3,745 \\ +342 \\ \hline 4,087; P, C \end{array}$

16.  $28 + 45$       17.  $259 + 113$       18.  $6,851 + 2,746$   
**73; P**      **372; P**      **9,597; P, C**

**Mental math** Add mentally. Write only the sum.

19.  $50 + 30$       20.  $412 + 67$       21.  $6,000 + 800$       22.  $804 + 73$   
**80**      **479**      **6,800**      **877**

23.  $76 + 21$       24.  $100 + 500$       25.  $1,350 + 4,602$       26.  $268 + 20$   
**97**      **600**      **5,952**      **288**

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used.

27. The combined chorus had 18 more girls than boys. There were 173 boys. How many girls were there?  
**191 girls; P**
28. The chorus sang 13 folk songs. Of these, 8 were American folk songs. The rest were Mexican. How many were Mexican songs?  
**5 songs; M**
29. The chorus gave a concert for 452 people on Friday and for 346 people on Saturday. Is it reasonable to say that 500 people attended the two performances? Explain why or why not. **No; Rounding each number to the nearest hundred gives 800 people; E.**
30. The combined chorus practiced together twice during Music Week. Each practice lasted 45 minutes. How many minutes did they practice together during that week?  
**90 minutes; M, P**

More Practice Set 22, page 359 57

## Assignment Guide

basic 1–26 odd or even, 27–30  
 average 1–15 odd or even, 16–30  
 enriched 1–15 odd or even, 16–30

**More Practice Set 22,**  
**page 359**

(Continued from page 56.)

Regroup the 12 units as 1 ten-stick and 2 units so that you now have 7 ten-sticks and 2 units. Write 72 as the answer. Then demonstrate Example B using a place-value box.

**Try** Students should estimate the sums for Exercises a–d before finding the exact answers. Exercise e is an example of the commutative property of addition:  $43 + 19 = 19 + 43$ .

**Practice** *Choosing a computation*

**method** For Exercises 1–18, accept varied methods for finding answers. Ask students to explain why they chose the method they did. See pages 445 and 451 of this Teacher's Edition for a discussion on mental math strategies and when to use a calculator.

**Apply** *Problem Solving* In Problem 29, point out that both numbers have the same number of digits, so they should round both of them to their greatest place, hundreds.

## Follow-Up

**Extra Practice** Have students complete the following computation square.

26	58	[84]
165	18	[183]
[191]	[76]	[267]

**Reteaching** Give students some numbers such as 6 hundreds 26 tens 3 ones [863] to rename. Have them write the numbers in a place-value chart before finding the standard form.

## Computer Assisted Instruction

Mathematics Courseware Series  
 • Addition and Subtraction 3, Activities 3, 4, 6

## Daily Maintenance

Give each number in words.

- 368 [Three hundred sixty-eight]
- 4,521 [Four thousand, five hundred twenty-one]
- 126,009 [One hundred twenty-six thousand, nine]
- 2,000,328 [Two million, three hundred twenty-eight]

## Enrichment 22

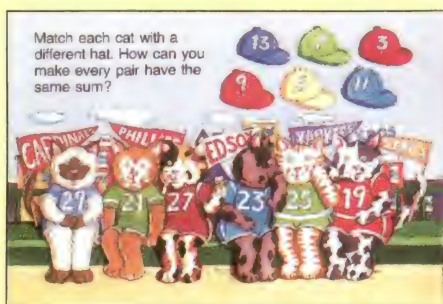
Name \_\_\_\_\_ E22

Up, Down, and Around

Complete the puzzle so that every number sentence is correct.

438	+	227	=	665						
+			+							
290			182	+	351	=	533			
=			=	+		+				
728	+	119	=	847						
				5,268		2,604				
				=		=				
				3,026	+	2,593	=	5,619		3,137
				=		+				
1,920	+	3,145	=	5,065						
				2,943						
				=		+				
				7,658	+	1,721	=	9,379		
				=						
3,283	+	1,381	=	4,664						

## Additional Resource 22



### Math Poster G Addition: One

**Renaming** From left to right, the cats that should be matched with the hats are as follows: 29/3, 21/11, 27/5, 23/9, 25/7, 19/13. The sum for each pair is 32. See Answer Key for a discussion of different ways to solve this problem.



**Objective 23** (Target Objective)  
Add two numbers with up to four digits with more than one renaming.

**Lesson Theme**  
Music: School Band

**Materials**

- Hundreds, Tens, Units (Punchouts or Math Kit)

**Introduction**

**Warm-Up Review** Review adding numbers with one renaming. Write each exercise in a place-value box and add. Use these examples:  
433 + 259 [692],  
161 + 362 [523],  
3,942 + 2,301 [6,243]

**Using the Pages**

**Teach** Draw a place-value box on the board. Write 1,987 and 2,108 in the box. Add the two numbers.

th	h	t	o
1	9	8	7
+2	1	0	8
3	10	8	15

Rename as 4,095. Then read and discuss the example stressing that renaming can be done more efficiently during the process of computation.

**Try Error Analysis** Watch for students who fail to rewrite Exercise d vertically or who fail to align the numbers properly. Have these students draw vertical lines on their papers so that small boxes are made. Then tell them to write only one digit in each box. (See Reteaching 23.)

**Practice Choosing a computation method**

Ask students to quickly scan Exercises 9–22. Have them generalize to identify those exercises that at first glance seem most appropriate for calculator computation. [Exercises involving addends with more than 3 digits are usually chosen. However, Exercise 12 does not involve any renaming.]

**Apply Problem Solving**

**Choosing a computation method** Have various students read the problems aloud to identify those problems that do not require an exact answer [Problem 24] and those that do not require computation. [Problem 25] In Problem 23, point out that 1,397 can become 1,400 by adding 3. Ask students what they would do to the sum after they add 1,400 and 1,329. [Subtract 3.] Allow students to complete the compensation process on their own. Refer to pages 445 and 451 in this Teacher's Edition for other computation strategies.

**Addition: More Than One Renaming**

The Cardozo High School Band traveled by bus to California to march in the Rose Bowl Parade. They traveled 1,987 miles going and 2,108 miles coming back by a different route. How many miles did the band travel in all?

Estimate using rounding:  
2,000 + 2,000 = 4,000

Find 1,987 + 2,108.

Add the ones.

$$\begin{array}{r} 1,987 \\ + 2,108 \\ \hline 5 \end{array}$$

Rename 15 ones as 1 ten 5 ones.

Add the tens.

$$\begin{array}{r} 1,987 \\ + 2,108 \\ \hline 95 \end{array}$$

Add the hundreds.

$$\begin{array}{r} 1,987 \\ + 2,108 \\ \hline 095 \end{array}$$

Rename 10 hundreds as 1 thousand 0 hundreds.

Add the thousands.

$$\begin{array}{r} 1,987 \\ + 2,108 \\ \hline 4,095 \end{array}$$

The band traveled 4,095 miles in all.

**Try Add.**

$$\begin{array}{r} 368 \\ + 593 \\ \hline 961 \end{array}$$

$$\begin{array}{r} 2,687 \\ + 2,951 \\ \hline 5,638 \end{array}$$

$$\begin{array}{r} 5,783 \\ + 768 \\ \hline 6,551 \end{array}$$

$$\begin{array}{r} 7,980 \\ + 485 \\ \hline 8,465 \end{array}$$

**Practice Add.**

$$\begin{array}{r} 297 \\ + 493 \\ \hline 790 \end{array}$$

$$\begin{array}{r} 629 \\ + 282 \\ \hline 911 \end{array}$$

$$\begin{array}{r} 366 \\ + 435 \\ \hline 801 \end{array}$$

$$\begin{array}{r} 452 \\ + 258 \\ \hline 710 \end{array}$$



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**Practice 23**

Name \_\_\_\_\_

Add: **P23**

1. $\begin{array}{r} 692 \\ + 139 \\ \hline 831 \end{array}$	2. $\begin{array}{r} 457 \\ + 385 \\ \hline 842 \end{array}$	3. $\begin{array}{r} 183 \\ + 269 \\ \hline 452 \end{array}$	4. $\begin{array}{r} 547 \\ + 366 \\ \hline 913 \end{array}$
5. $\begin{array}{r} 249 \\ + 382 \\ \hline 631 \end{array}$	6. $\begin{array}{r} 473 \\ + 287 \\ \hline 760 \end{array}$	7. $\begin{array}{r} 1936 \\ + 2415 \\ \hline 4,351 \end{array}$	8. $\begin{array}{r} 3636 \\ + 4859 \\ \hline 8,495 \end{array}$

9.  $\begin{array}{r} 2,075 \\ + 3,867 \\ \hline 5,942 \end{array}$     10.  $\begin{array}{r} 5,642 \\ + 2,781 \\ \hline 8,423 \end{array}$     11.  $\begin{array}{r} 9,532 \\ + 6,632 \\ \hline 16,164 \end{array}$     12.  $\begin{array}{r} 564 \\ + 76 \\ \hline 640 \end{array}$

13.  $658 + 293 = \underline{951}$     14.  $6,904 + 387 = \underline{7,291}$

Solve each problem.

15. The Newton School has 467 students. The Easton School has 285 students. How many students are there altogether in the two schools?  
752 students

16. Al Kaline played in 2,824 games in his major league baseball career. Frank Robinson played in 2,804 games. Who played in more games?  
Al Kaline

**Reteaching 23**

Name \_\_\_\_\_ **R23**

Find  $436 + 287$ .

1 ten

$$\begin{array}{r} 436 \\ + 287 \\ \hline 13 \end{array}$$

3 ones

1 hundred

$$\begin{array}{r} 436 \\ + 287 \\ \hline 12 \end{array}$$

2 tens

$$\begin{array}{r} 436 \\ + 287 \\ \hline 23 \end{array}$$

1 + 4 + 2 = 7

Help the pilot below fly from Jamaica to Trinidad.

Remember: Always add from right to left.

Add. Then follow your answers through the maze.

1. $\begin{array}{r} 4367 \\ + 1258 \\ \hline 5625 \end{array}$	2. $\begin{array}{r} 1329 \\ + 5814 \\ \hline 7143 \end{array}$	3. $\begin{array}{r} 265 \\ + 387 \\ \hline 652 \end{array}$	4. $\begin{array}{r} 589 \\ + 124 \\ \hline 713 \end{array}$
5. $\begin{array}{r} 478 \\ + 368 \\ \hline 846 \end{array}$	6. $\begin{array}{r} 2934 \\ + 5736 \\ \hline 8570 \end{array}$	7. $\begin{array}{r} 1247 \\ + 3489 \\ \hline 4736 \end{array}$	8. $\begin{array}{r} 1685 \\ + 4239 \\ \hline 5924 \end{array}$
9. $\begin{array}{r} 367 \\ + 547 \\ \hline 914 \end{array}$	10. $\begin{array}{r} 1793 \\ + 2596 \\ \hline 4389 \end{array}$	11. $\begin{array}{r} 479 \\ + 248 \\ \hline 727 \end{array}$	12. $\begin{array}{r} 2862 \\ + 2509 \\ \hline 5371 \end{array}$
13. $\begin{array}{r} 198 \\ + 519 \\ \hline 717 \end{array}$	14. $\begin{array}{r} 3199 \\ + 2071 \\ \hline 5270 \end{array}$		

Jamaica

Trinidad

5,625	6,133	4,625	8,570	4,736	5,924	914	4,389	717	5,270
7,143	652	713	846	7,560	804	3,289	727	5,371	9,027





Be smart.  
Estimate when  
you calculate.

$$\begin{array}{r} 5. \quad 593 \\ + 668 \\ \hline 1,261 \end{array}$$

$$\begin{array}{r} 6. \quad 386 \\ + 857 \\ \hline 1,243 \end{array}$$

$$\begin{array}{r} 7. \quad 2,615 \\ + 5,846 \\ \hline 8,461 \end{array}$$

$$\begin{array}{r} 8. \quad 6,548 \\ + 3,624 \\ \hline 10,172 \end{array}$$

**Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math  
Add. Choose a method to find each answer. Tell which method you used.

$$\begin{array}{r} 9. \quad 8,735 \\ + 2,883 \\ \hline 11,618; \text{ P, C} \end{array}$$

$$\begin{array}{r} 10. \quad 6,674 \\ + 2,751 \\ \hline 9,425; \text{ P, C} \end{array}$$

$$\begin{array}{r} 11. \quad 4,367 \\ + 2,435 \\ \hline 6,802; \text{ P, C} \end{array}$$

$$\begin{array}{r} 12. \quad 2,179 \\ + 5,320 \\ \hline 7,499; \text{ M} \end{array}$$

$$\begin{array}{r} 13. \quad 3,487 \\ + 3,666 \\ \hline 7,153; \text{ P, C} \end{array}$$

$$\begin{array}{r} 14. \quad 5,636 + 2,889 \\ \hline 8,525; \text{ P, C} \end{array}$$

$$\begin{array}{r} 15. \quad 694 + 36 \\ \hline 730; \text{ P} \end{array}$$

$$\begin{array}{r} 16. \quad 385 + 15 \\ \hline 400; \text{ M} \end{array}$$

$$\begin{array}{r} 17. \quad 7,463 + 4,859 \\ \hline 12,322; \text{ P, C} \end{array}$$

$$\begin{array}{r} 18. \quad 6,878 + 8,342 \\ \hline 15,220; \text{ P, C} \end{array}$$

$$\begin{array}{r} 19. \quad 1,782 + 956 \\ \hline 2,738; \text{ P, C} \end{array}$$

$$\begin{array}{r} 20. \quad 8,127 + 386 \\ \hline 8,513; \text{ P, C} \end{array}$$

$$\begin{array}{r} 21. \quad 853 + 279 \\ \hline 1,132; \text{ P, C} \end{array}$$

$$\begin{array}{r} 22. \quad 4,680 + 7,976 \\ \hline 12,656; \text{ P, C} \end{array}$$

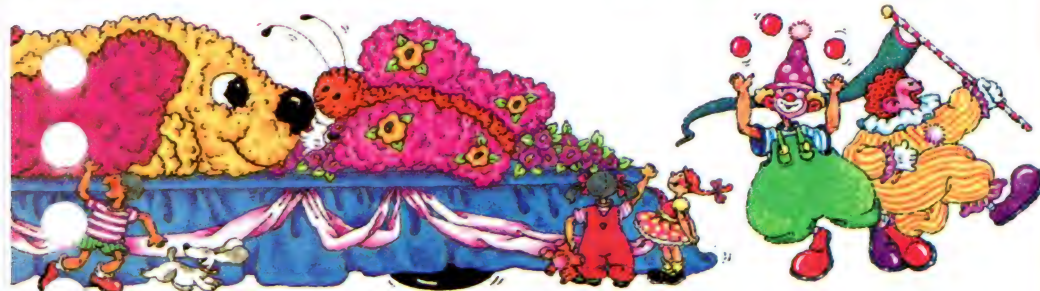
**Apply** **Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.  
Explain to another student why you chose that method.

23. The Central High School Band traveled 1,329 miles to the Orange Bowl Parade. The return trip was 1,397 miles. How many miles did the band travel in all?  
**2,726 miles; P, C**

25. Did the Central High School Band travel farther going to the Orange Bowl Parade or returning home? Use the information in Problem 23.  
**Returning home; M**

24. The Willis High School Band traveled 1,017 miles to the Cotton Bowl Parade and 895 miles home. Did the band travel more or less than 2,000 miles in all?  
**Less; E**

26. A band on tour made trips of 524 miles, 687 miles, 321 miles, 1,029 miles, and 476 miles. How many miles did the band travel?  
**3,037 miles; C**



More Practice Set 23, page 360 **59**

## Assignment Guide

basic	1–8, 10–22 even, 23–26
average	1–8, 9–22 odd or even, 23–26
enriched	1–26

**More Practice Set 23,**  
**page 360**

## Follow-Up

**Extra Practice** Let pairs of students write down three- or four-digit numbers and take turns finding the sums. The answers can be checked using a calculator.

You also may wish to adapt the games on pages 160–161 for use with this lesson.

**Reteaching** Have students use place-value boxes to add two numbers with up to four digits with more than one renaming. Or have students rename such numbers as 2 hundreds 12 tens 13 ones. [333]

**Enrichment** **Try and check** Using the digits 1–8 (each only once), have students give the two four-digit numbers with the greatest sum. [7 and 8 in thousands place, 5 and 6 in hundreds place, 4 and 3 in tens place, 1 and 2 in ones place]

## Calculator

Have students plan a trip involving several stops. Then have them use distance charts on road maps or atlases to find the distances between stops and add to find the total distance of their trips. Remind the students that they must return home at the end of their trips.

## Reading and Writing Mathematics

Have students unscramble the following mathematical terms. Then, tell them to find these words in the glossary and write the meaning of each one. ums [Sum: the answer to an addition problem]. neadd [Addend: a number that is added]. tigdi [Digit: any of the single symbols used to write numbers]

## Daily Maintenance

**Mental Math** Have students give the number that is 100 greater than the number in each exercise. Then have them give the number that is 100 less.

- 692 [792, 592]
- 4,700 [4,800, 4,600]
- 117 [217, 17]
- 286 [386, 186]
- 5,062 [5,162, 4,962]

## Enrichment 23

Name \_\_\_\_\_ **E23**

**Find the Buried Treasure**

This is a map of Spirit Island where a pirate's treasure is buried. To find the treasure, first find the missing digits in each exercise below.

- $$\begin{array}{r} 3 \quad 9 \quad 4 \\ + 4 \quad 1 \quad 7 \\ \hline 8 \quad 1 \quad 1 \end{array}$$
- $$\begin{array}{r} 3 \quad 0 \quad 5 \\ + 1 \quad 6 \quad 7 \\ \hline 4 \quad 7 \quad 2 \end{array}$$
- $$\begin{array}{r} 2 \quad 4 \quad 8 \\ + 4 \quad 7 \quad 2 \\ \hline 7 \quad 2 \quad 0 \end{array}$$
- $$\begin{array}{r} 2 \quad 8 \quad 9 \\ + 3 \quad 4 \quad 7 \\ \hline 6 \quad 3 \quad 6 \end{array}$$
- $$\begin{array}{r} 7 \quad 5 \quad 9 \\ + 1 \quad 7 \quad 3 \\ \hline 9 \quad 3 \quad 2 \end{array}$$
- $$\begin{array}{r} 1 \quad 0 \quad 6 \\ + 2 \quad 8 \quad 7 \\ \hline 3 \quad 9 \quad 3 \end{array}$$
- $$\begin{array}{r} 1 \quad 6 \quad 3 \quad 9 \\ + 4 \quad 3 \quad 6 \\ \hline 2 \quad 0 \quad 7 \quad 3 \end{array}$$
- $$\begin{array}{r} 5 \quad 3 \quad 4 \quad 4 \\ + 9 \quad 0 \quad 9 \\ \hline 6 \quad 2 \quad 5 \quad 3 \end{array}$$
- $$\begin{array}{r} 4 \quad 2 \quad 8 \quad 8 \\ + 3 \quad 2 \quad 3 \quad 2 \\ \hline 7 \quad 5 \quad 2 \quad 0 \end{array}$$
- $$\begin{array}{r} 6 \quad 4 \quad 7 \quad 4 \\ + 1 \quad 6 \quad 6 \quad 6 \\ \hline 8 \quad 1 \quad 4 \quad 0 \end{array}$$

Start from the X at Pirate's Cove. Connect the points on the map by following the digits you find in the hundreds place of each sum.

11. Where is the treasure?  
**At the shipwreck**

The shape of the path tells you where the treasure is buried.

## Additional Resource 23

Name \_\_\_\_\_ **Additional Resource 23**

**Mental Math** Easy Adding with Zeros

These addition exercises are easy because the numbers end in 0. You can do them in your head.

Add mentally. Then write the letter of the correct answer on each blank.

- 300 + 400 **L**
- 50 + 90 **A**
- 200 + 300 + 400 **E**
- 500 + 100 + 400 **B**
- 180 + 30 **H**
- 230 + 90 **N**
- 450 + 70 **K**
- 2,000 + 5,000 **F**
- 4,000 + 400 **D**
- 2,000 + 3,200 **C**
- 3,000 + 500 + 70 **O**
- 600 + 4,500 **M**
- 400 + 50 + 60 **G**
- 300 + 40 + 30 + 400 **I**
- 17 tens + 3 tens **J**

- 140
- 1 thousand
- 5,200
- 44 hundred
- 900
- 7 thousand
- 510
- 210
- 770
- 200
- 520
- 7 hundred
- 5,100
- 32 tens
- 3,570



**Objective 24** (Target Objective)  
Add three or more numbers with up to four digits.

### Lesson Theme

Careers: Children's Dentist

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Number cubes (Punchouts or Math Kit)
- Number lines (Teaching Aid A)

### Introduction

**Using Concrete Materials** Using the activity found in *Teach* on page 56, you can have students use counters to add three or more addends. Have students add  $52 + 78 + 36$  [166] using counters. Remind them to exchange 10 unit-squares for a ten-stick and 10 ten-sticks for a hundred square whenever possible.

Review the addition of three numbers with no renaming. Draw 4, 3, and 2 dots on the chalkboard. Count the dots and find the sum. [9] Put the numbers and dots in a different order. Find the sum again. [9] Observe that the sum of three numbers is the same regardless of the order in which they are added.

### Using the Pages

**Teach** Read and discuss the examples. In Example B, stress that students should look for groups of ten before adding. Other teaching examples:  
 $48 + 15 + 25$  [88]  
 $24 + 43 + 76$  [143]

**Try Error Analysis** Watch for students who have difficulty adding three or more numbers and have them write down partial sums as they add.

**Practice** Students having difficulty may need to write each exercise in a place-value box to help them align digits properly.

**Choosing a computation method** For Exercises 10 and 17, point out that the digits in the ones place total 10. Encourage them to look for combinations of numbers that give a multiple of ten. (Exercises 14, 16, and 18)

**Apply Problem Solving** Discussing each problem before solving it will help students improve their problem-solving skills.

**Use physical models** For Problem 23, tell students that the appointment started at 3:30 PM. Have them use a clock to show when the appointment ended.

### Three or More Addends

**A. Career** Dr. Mike Madaus is a children's dentist. On Monday he saw 8 patients for fillings, 5 patients for tooth removals, and 12 patients for routine checkups. How many patients did Dr. Mike see on Monday?

Find  $8 + 5 + 12$ .

Add the ones.

$$\begin{array}{r} 8 \\ 5 \\ + 12 \\ \hline 5 \end{array}$$

$8 + 5 = 13$   
 $13 + 2 = 15$

Add the tens.

$$\begin{array}{r} 8 \\ 5 \\ + 12 \\ \hline 25 \end{array}$$

Dr. Mike saw 25 patients on Monday.

**B.** Find  $27 + 49 + 13$ .

Look for sums of 10 to help you add mentally.

Add the ones.

$$\begin{array}{r} 27 \\ 49 \\ + 13 \\ \hline 9 \end{array}$$

$7 + 3 = 10$   
 $10 + 9 = 19$

Add the tens.

$$\begin{array}{r} 27 \\ 49 \\ + 13 \\ \hline 89 \end{array}$$

**Try Add.**

**a.**

$$\begin{array}{r} 3 \\ 7 \\ + 24 \\ \hline 34 \end{array}$$

**b.**

$$\begin{array}{r} 639 \\ 527 \\ + 256 \\ \hline 1,422 \end{array}$$

**c.**

$$\begin{array}{r} 6,509 \\ 2,872 \\ + 1,969 \\ \hline 11,350 \end{array}$$

**d.**  $26 + 358 + 497 + 32$   
**913**



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### Practice 24

Student Name: \_\_\_\_\_ P24

Add

1. $\begin{array}{r} 7 \\ 5 \\ + 6 \\ \hline 18 \end{array}$	2. $\begin{array}{r} 9 \\ 8 \\ + 4 \\ \hline 21 \end{array}$	3. $\begin{array}{r} 28 \\ 37 \\ + 52 \\ \hline 117 \end{array}$	4. $\begin{array}{r} 54 \\ 78 \\ + 31 \\ \hline 163 \end{array}$
5. $\begin{array}{r} 72 \\ 63 \\ + 45 \\ \hline 180 \end{array}$	6. $\begin{array}{r} 434 \\ 267 \\ + 385 \\ \hline 1,086 \end{array}$	7. $\begin{array}{r} 721 \\ 646 \\ + 747 \\ \hline 2,114 \end{array}$	8. $\begin{array}{r} 123 \\ 456 \\ + 31 \\ \hline 1,368 \end{array}$
9. $\begin{array}{r} 2381 \\ 4762 \\ + 7539 \\ \hline 14,682 \end{array}$	10. $\begin{array}{r} 5761 \\ 2937 \\ + 8497 \\ \hline 17,095 \end{array}$	11. $\begin{array}{r} 157 \\ 29 \\ + 832 \\ \hline 1,018 \end{array}$	12. $\begin{array}{r} 1465 \\ 389 \\ + 3034 \\ \hline 4,888 \end{array}$

13.  $460 + 56 + 65 + 107 = 688$

14.  $5,777 + 1,021 + 344 = 7,142$

15.  $3,418 + 1,006 + 4,902 + 1,271 = 10,597$

Solve each problem

16. Central School has 231 fourth-graders, 283 fifth-graders, and 300 sixth-graders. What is the total number of students in these grades?  
**814 students**

17. March has 31 days. April has 30 days. May has 31 days. June has 30 days. How many days are there altogether in these four months?  
**122 days**

### Reteaching 24

Student Name: \_\_\_\_\_ R24

Find  $14 + 47 + 36$ .

tens ones    1 ten    tens ones

$$\begin{array}{r} 14 \\ 47 \\ + 36 \\ \hline 97 \end{array}$$

4 + 7 + 6 = 17    1 + 4 + 3 = 8

Add

1. $\begin{array}{r} 8 \\ 5 \\ + 2 \\ \hline 15 \end{array}$	2. $\begin{array}{r} 7 \\ 4 \\ + 5 \\ \hline 16 \end{array}$	3. $\begin{array}{r} 8 \\ 7 \\ + 7 \\ \hline 19 \end{array}$	4. $\begin{array}{r} 6 \\ 5 \\ + 6 \\ \hline 17 \end{array}$
5. $\begin{array}{r} 9 \\ 1 \\ + 4 \\ \hline 14 \end{array}$	6. $\begin{array}{r} 24 \\ 18 \\ + 36 \\ \hline 78 \end{array}$	7. $\begin{array}{r} 43 \\ 26 \\ + 15 \\ \hline 84 \end{array}$	8. $\begin{array}{r} 19 \\ 54 \\ + 23 \\ \hline 96 \end{array}$
9. $\begin{array}{r} 36 \\ 24 \\ + 22 \\ \hline 82 \end{array}$	10. $\begin{array}{r} 14 \\ 46 \\ + 15 \\ \hline 75 \end{array}$	11. $\begin{array}{r} 25 \\ 18 \\ + 11 \\ \hline 54 \end{array}$	12. $\begin{array}{r} 12 \\ 57 \\ + 16 \\ \hline 85 \end{array}$
13. $\begin{array}{r} 47 \\ 26 \\ + 10 \\ \hline 83 \end{array}$	14. $\begin{array}{r} 27 \\ 52 \\ + 19 \\ \hline 98 \end{array}$	15. $\begin{array}{r} 26 \\ 25 \\ + 14 \\ \hline 65 \end{array}$	16. $\begin{array}{r} 27 \\ 39 \\ + 13 \\ \hline 79 \end{array}$

Check off your answers. They are all here

19	65	54	14
79	84	16	98
96	82	83	17
15	75	85	78



## CALCULATOR

### Practice Add.

- |   |  |   |   |
|---|--|---|---|
| 1. $\begin{array}{r} 2 \\ 6 \\ + 37 \\ \hline 45 \end{array}$   | 2. $\begin{array}{r} 37 \\ 5 \\ + 19 \\ \hline 61 \end{array}$   | 3. $\begin{array}{r} 24 \\ 37 \\ + 56 \\ \hline 117 \end{array}$      | 4. $\begin{array}{r} 46 \\ 17 \\ + 65 \\ \hline 128 \end{array}$      |
| 5. $\begin{array}{r} 37 \\ 28 \\ + 15 \\ \hline 80 \end{array}$ | 6. $\begin{array}{r} 79 \\ 27 \\ + 18 \\ \hline 124 \end{array}$ | 7. $\begin{array}{r} 410 \\ 361 \\ + 233 \\ \hline 1,004 \end{array}$ | 8. $\begin{array}{r} 432 \\ 371 \\ + 754 \\ \hline 1,557 \end{array}$ |

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math

Choose a method to solve each problem. Tell which method you used.

- |   |   |   |   |
|---|---|---|---|
| 9. $\begin{array}{r} 105 \\ 562 \\ + 347 \\ \hline 1,014; \text{ P, C} \end{array}$   | 10. $\begin{array}{r} 392 \\ 747 \\ + 741 \\ \hline 1,880; \text{ P, C} \end{array}$  | 11. $\begin{array}{r} 3,162 \\ 6,392 \\ + 4,861 \\ \hline 14,415; \text{ P, C} \end{array}$ | 12. $\begin{array}{r} 1,322 \\ 1,074 \\ + 7,429 \\ \hline 9,825; \text{ P, C} \end{array}$          |
| 13. $\begin{array}{r} 63 \\ 24 \\ 43 \\ + 36 \\ \hline 166; \text{ P, C} \end{array}$ | 14. $\begin{array}{r} 97 \\ 52 \\ 13 \\ + 28 \\ \hline 190; \text{ P, C} \end{array}$ | 15. $\begin{array}{r} 306 \\ 245 \\ 124 \\ + 212 \\ \hline 887; \text{ P, C} \end{array}$   | 16. $\begin{array}{r} 1,971 \\ 1,834 \\ 3,256 \\ + 1,123 \\ \hline 8,184; \text{ P, C} \end{array}$ |
17.  $76 + 52 + 62$   
**190; P**
19.  $217 + 485 + 812$   
**1,514; P, C**
21.  $482 + 67 + 145$   
**694; P, C**
18.  $42 + 17 + 38 + 13$   
**110; P, C**
20.  $392 + 647 + 423 + 125$   
**1,587; P, C**
22.  $36 + 745 + 801 + 25$   
**1,607; P, C**

### Apply Solve each problem.

23. It took Dr. Mike 10 minutes to examine Estela's teeth, 19 minutes to clean her teeth, and 18 minutes to fill a tooth. How many minutes did all of this take?  
**47 minutes**
24. Dr. Mike saw 25 patients on Monday, 19 on Tuesday, 22 on Thursday, and 21 on Friday. How many patients did he see during those four days?  
**87 patients**
25. A filling costs \$33 and X rays cost \$24. Which costs more, a filling or X rays?  
**A filling**

Numbers like 545, 3,883, and 21,012 are called **palindromes**. In a palindrome, the digits are in the same order whether you read from left to right, or from right to left.

A palindrome can be made by using addition. A calculator can help with the addition. Follow these steps.

- Enter a number on your calculator.
- Reverse the digits and add.
- If the sum is not a palindrome, continue to reverse the digits and add.

Press:  $48 + 84 =$   
Display: **132** *132 is not a palindrome.*  
Press:  $+ 231 =$   
Display: **363** *363 is a palindrome.*

Make a palindrome from each number.

- |                           |                            |
|---------------------------|----------------------------|
| 1. 63<br><b>99</b>        | 2. 29<br><b>121</b>        |
| 3. 79<br><b>44,044</b>    | 4. 86<br><b>1,111</b>      |
| 5. 235<br><b>767</b>      | 6. 529<br><b>5,995</b>     |
| 7. 7,543<br><b>11,011</b> | 8. 5,716<br><b>293,392</b> |

## Assignment Guide

basic	1–8, 9–22 odd or even, 23–25
average	1–16 odd or even, 17–25
enriched	1–25

**More Practice Set 24, page 360**

### Calculator, page 61

When students do Exercises 7 and 8, they might need to write down the numbers in order to remember them. Following is the number of steps it takes to make a palindrome from each number: 1. (1 step), 2. (1 step), 3. (6 steps), 4. (3 steps), 5. (1 step), 6. (2 steps), 7. (2 steps), 8. (6 steps).

### Follow-Up

**Extra Practice** Have each student roll a pair of number cubes to get a two-digit number. (The first roll produces the tens digit and the second roll produces the ones digit.) The student rolls three times, writes the numbers down, and finds the sum.

**Enrichment** Have students find the sum of the numbers on each of the following items: a clock face, a telephone dial, a ruler, and a calculator.

### Computer Assisted Instruction

Mathematics Courseware Series

- Addition and Subtraction 4, Activity 2

More Practice Set 24, page 360

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## Enrichment 24

E24

**Pascal's Triangle**

The triangle of numbers below is called **Pascal's Triangle**.

1. Find the pattern and fill in the missing numbers.

2. Give the sum for each row.

Row 1: \_\_\_\_\_

Row 2: \_\_\_\_\_

Row 3: \_\_\_\_\_

Row 4: **8**

Row 5: **16**

Row 6: **32**

Row 7: **64**

Row 8: **128**

Row 9: **256**

Row 10: **512**

**Answers may vary.**

3. Draw a triangle around three numbers that sum to 4.

4. Draw a triangle around six numbers that sum to 16.

5. Draw a triangle around ten numbers that sum to 64.

6. Draw a triangle around fifteen numbers that sum to 256.

7. What do you notice about the rows and the triangles that have the same sum?  
**One side of the triangle is contained in the row.**

## Additional Resource 24

Make a sum of 27 along each branch. Use each of the numbers 1-9 exactly once.

### Math Poster H Three or More Addends

There are two horizontal branches: from left to right, they should read 12, 3, 1, 11 and 9, 6, 4, 8. The branch from top left to bottom center should read 12, 2, 6, 7. See **Answer Key** for remaining answers and two simpler problems like this.

### Daily Maintenance

**Mental Math** Have students answer these exercises orally.

- $9 + 6$  [15]
- $5 + 4$  [9]
- $8 + 5$  [13]
- $6 + 4$  [10]
- $2 + 9$  [11]



## Practice

Mixed Practice for Objectives 20–24

## Introduction

**Warm-Up Review** Review addition with renaming, using  $728 + 394$  [1,122] and  $275 + 346$  [621]. Work and discuss each example with the class. Remind students to rewrite horizontal exercises in vertical form and to be careful to line up the digits in the correct place-value positions.

## Using the Pages

**Practice** Exercises 1–28 involve mixed practice for addition with some exercises requiring no renaming (Exercises 4, 8), some exercises requiring one renaming (Exercises 1–3, 5, 11, 21–24, and 26), and some exercises requiring more than one renaming (Exercises 6, 7, 9, 10, 12–15, 25, 27, and 28). Exercises 16–20 all have three addends.

Students may be able to compute Exercises 13, 16, and 17 mentally by finding groups of 10.

**Calculator** Remind students to be careful when entering addends with 3 or more digits into their calculators. Some students may forget to enter the  $+$  symbol twice when adding 3 addends. Suggest that they quietly say each number and “plus” aloud as they enter it to help ensure that the problem is computed correctly.

**Estimation** Have students estimate in Exercises 16–20. Here are two ways they might use to estimate.

1.  $174 + 127 + 254$

Round each number to the nearest hundred.  $200 + 100 + 300 = 600$ . The estimate is 600.

2.  $174 + 127 + 254$

First add the hundreds.  $100 + 100 + 200 = 400$  Then look at  $74 + 27 + 54$ .  $74 + 27 \approx 100$  and  $100 + 54 \approx 150$ . So the final estimate is  $400 + 150 = 550$ .

Have students indicate which method they used for each exercise. Discuss which method was easier and which was more accurate.

**Apply Problem Solving** Some students can grasp a better understanding of problems by demonstrating them.

**Draw a picture** For Problem 33, students may wish to draw a picture to show the number of hours each day. They could use a clock symbol to twos to determine the answer.

(Continued on page 63.)

## Practice: Addition

**Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math • Add. For Exercises 1–28, choose a method to find each answer. Tell which method you used.

- |  |  |   |   |   |
|--|--|---|---|---|
| 1. $\begin{array}{r} 87 \\ + 5 \\ \hline \end{array}$<br>92; M               | 2. $\begin{array}{r} 46 \\ + 38 \\ \hline \end{array}$<br>84; M, P         | 3. $\begin{array}{r} 746 \\ + 235 \\ \hline \end{array}$<br>981; P            | 4. $\begin{array}{r} 234 \\ + 562 \\ \hline \end{array}$<br>796; P              | 5. $\begin{array}{r} 573 \\ + 292 \\ \hline \end{array}$<br>865; P                    |
| 6. $\begin{array}{r} 543 \\ + 278 \\ \hline \end{array}$<br>821; P           | 7. $\begin{array}{r} 729 \\ + 484 \\ \hline \end{array}$<br>1,213; P       | 8. $\begin{array}{r} 5,201 \\ + 3,698 \\ \hline \end{array}$<br>8,899; M      | 9. $\begin{array}{r} 3,754 \\ + 4,629 \\ \hline \end{array}$<br>8,383; P, C     | 10. $\begin{array}{r} 6,784 \\ + 3,662 \\ \hline \end{array}$<br>10,446; P, C         |
| 11. $\begin{array}{r} 5,048 \\ + 1,736 \\ \hline \end{array}$<br>6,784; P, C | 12. $\begin{array}{r} 3,625 \\ + 947 \\ \hline \end{array}$<br>4,572; P, C | 13. $\begin{array}{r} 1,708 \\ + 392 \\ \hline \end{array}$<br>2,100; P, C    | 14. $\begin{array}{r} 6,872 \\ + 553 \\ \hline \end{array}$<br>7,425; P, C      | 15. $\begin{array}{r} 4,636 \\ + 382 \\ \hline \end{array}$<br>5,018; P, C            |
| 16. $\begin{array}{r} 83 \\ 71 \\ + 46 \\ \hline \end{array}$<br>200; P      | 17. $\begin{array}{r} 97 \\ 72 \\ + 81 \\ \hline \end{array}$<br>250; P, C | 18. $\begin{array}{r} 157 \\ 538 \\ + 226 \\ \hline \end{array}$<br>921; P, C | 19. $\begin{array}{r} 248 \\ 578 \\ + 436 \\ \hline \end{array}$<br>1,262; P, C | 20. $\begin{array}{r} 4,625 \\ 4,019 \\ + 1,268 \\ \hline \end{array}$<br>9,912; P, C |
| 21. $38 + 43$<br>81; P   | 22. $754 + 72$<br>826; P, C  | 23. $369 + 223$<br>592; P, C  | 24. $3,073 + 1,552$<br>4,625; P, C  |   |
| 25. $896 + 344$<br>1,240; P, C   | 26. $634 + 48$<br>682; P   | 27. $4,853 + 395$<br>5,248; P, C  | 28. $7,639 + 1,586$<br>9,225; P, C  |   |

**Apply** Solve each problem.

29. Last week Dr. Mike filled 27 teeth. He filled 17 more teeth this week than last week. How many teeth did he fill this week?  
**44 teeth**
31. **Estimation** During Dental Week Dr. Mike talked to 257 students and 105 parents. Estimate how many people he talked to in all. First round each number to the nearest hundred.  
**400 people**
33. Each week Dr. Mike's office is open 8 hours per day for 3 days, and 10 hours per day for 2 days. How many hours is his office open each week?  
**44 hours**
30. Dr. Mike has 367 “No Cavities” stickers and 258 “Good Checkup” stickers to give patients. How many stickers does he have in all?  
**625 stickers**
32. Aaron's dental appointment lasted 37 minutes. His brother's appointment lasted 15 minutes longer. How long did his brother's appointment last?  
**52 minutes**
34. **CALCULATOR** A float in the Rose Bowl Parade was decorated with 4,650 red flowers, 5,465 white flowers, 4,270 yellow flowers, and 3,845 orange flowers. How many flowers in all were used on the float?  
**18,230 flowers**

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## Practice Game

### Addition Relay

**Number of players:** 3 to 5 teams of 6 players each

**Materials:** Chalk, one calculator per team

#### Rules

1. Write a different addition exercise on the board for each team. Examples follow.

Team 1	Team 2	Team 3	Team 4
$\begin{array}{r} 645 \\ + 58 \\ \hline \end{array}$	$\begin{array}{r} 736 \\ + 79 \\ \hline \end{array}$	$\begin{array}{r} 407 \\ + 86 \\ \hline \end{array}$	$\begin{array}{r} 368 \\ + 59 \\ \hline \end{array}$
[ 703 ]	[ 815 ]	[ 493 ]	[ 427 ]

2. Choose a student for each team to check answers with a calculator.

3. The first player in each team goes to the chalkboard, does the exercise, and then passes the chalk to the second player. The student with the calculator checks the answer. Any player who has an incorrect answer must do the problem correctly before the next player can take a turn.

4. The second player goes to the chalkboard and writes a new exercise made up of the sum and the second



## Assignment Guide

basic	1–36 even, 37–56, 67–69
average	1–32 odd or even, 34–61, 67–69
enriched	1–28 odd or even, 29–36, 52–69

(Continued from page 62.)

**Use data from outside the text** For Problem 35, you may want to have some students find how many deciduous (baby) teeth a child has [20], and how many permanent teeth an adult usually has. [32]

Words like *round trip* should become familiar to students. Have them use a dictionary if they don't know the meaning already.

Review how to complete and check addition squares before students do Exercises 37–66.

**Calculator** Encourage students to write the sequences of keys pressed as they determine the answers to Problems 67 and 68.

**List all possibilities** For Problem 69, students can make a table to list the possibilities until they find a combination of eleven coins with a value of 57 cents. A possible table is shown below.

1¢	5¢	10¢	25¢	Total
2	7	1	1	72¢
2	6	2	1	77¢
2	5	3	1	82¢
2	4	4	1	87¢
7	2	1	1	52¢
7	1	2	1	57¢

## Follow-Up

Have students play the game that is described below the lesson pages. Use the exercises that are provided for the first game. For subsequent games, you may want to use the following exercises.

368	286	147	597
+ 159	+ 367	+ 198	+ 217
[527]	[653]	[345]	[814]
2,487	2,878	3,782	4,653
+ 166	+ 257	+ 289	+ 958
[2,653]	[3,135]	[4,071]	[5,611]

## Daily Maintenance

Round each number to the nearest thousand.

- 7,134 [7,000]
- 6,280 [6,000]
- 3,784 [4,000]
- 1,625 [2,000]
- 9,842 [10,000]

Answers, page 63

See page 85 of this Teacher's Edition.

35. **Mental math** By age nine, Terri had lost 10 teeth. By age twelve, she had lost 10 more teeth. How many teeth did she lose in all?  
**20 teeth**

Add across. Add down.

63	21	37. <b>84</b>
34	52	38. <b>86</b>
39. <b>97</b>	40. <b>73</b>	41. <b>170</b>

46	45	42. <b>91</b>
27	47	43. <b>74</b>
44. <b>73</b>	45. <b>92</b>	46. <b>165</b>

Be smart.  
Estimate when you calculate.

74	29	47. <b>103</b>
25	57	48. <b>82</b>
49. <b>99</b>	50. <b>86</b>	51. <b>185</b>

118	109	52. <b>227</b>
296	272	53. <b>568</b>
54. <b>414</b>	55. <b>381</b>	56. <b>795</b>

185	49	57. <b>234</b>
289	98	58. <b>387</b>
59. <b>474</b>	60. <b>147</b>	61. <b>621</b>

47	689	62. <b>736</b>
68	153	63. <b>221</b>
64. <b>115</b>	65. <b>842</b>	66. <b>957</b>

67. **CALCULATOR** Make the display show 50. Use only these keys: 4, 5, +, =.  
**See margin.**

69. Becky has 57 cents.

She has 11 coins.

She has at least one quarter, one dime, one nickel, and one penny.

Work with another student to find how many of each of the coins Becky has.

**7 pennies, 1 nickel, 2 dimes, and 1 quarter**

68. **CALCULATOR** Do Problem 67 again, using the same keys. Use the *least* number of keys. Compare key sequences with your classmates.  
**See margin.**



63

addend of the first exercise. Then he or she does the exercise and passes the chalk to the third player. The answers are checked as in step 3.

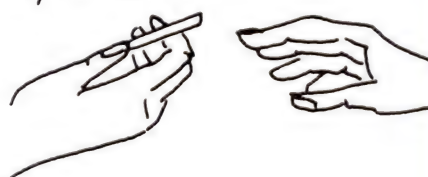
5. Continue playing in this way until all team members have had turns.

**The Winner:** The first team to complete all their exercises correctly wins.

Team 1

$$\begin{array}{r} 396 \\ + 186 \\ \hline 582 \end{array} \quad \begin{array}{r} 582 \\ + 186 \\ \hline 768 \end{array} \quad \begin{array}{r} 768 \\ + 186 \\ \hline 954 \end{array}$$

$$\begin{array}{r} 954 \\ + 186 \\ \hline 1,140 \end{array}$$





## Objective 25

Estimate the difference of two numbers and subtract numbers with up to four digits with no renaming.

### Lesson Theme

Science: Endangered Species

### Materials

- Number lines (Teaching Aid A)

## Introduction

**Warm-Up Review** Review rounding numbers to the nearest ten, hundred, and thousand. Round a four-digit number such as 1,718 to the nearest ten [1,720]; nearest hundred [1,700]; nearest thousand [2,000].

**Motivational Situation** Pose the following problem to the students. Are there a lot of robins in the world? Discuss how scientists know that some birds are endangered. [Counting birds by tagging them, observation of nesting sites]

## Using the Pages

**Teach** Read and discuss the example. Then write it on the chalkboard and round both numbers to the nearest ten. [ $480 - 220 = 260$ ] Other teaching examples:

$$378 - 251 \text{ [} 400 - 300 = 100 \text{]}$$

$$8,247 - 3,891 \text{ [} 8,000 - 4,000 = 4,000 \text{]}$$

**Try Error Analysis** In Exercises d, e, and f, watch for students who do not round both numbers to the same place. Remind students who make this error that they should use the number with fewer digits when deciding to which place they should round. (See Reteaching 25.)

**Practice** Be sure students round both numbers to the nearest ten in Exercises 7–10. Notice that in Exercise 9, rounding the nearest ten affects the hundreds digit.

**Apply Problem Solving** Have a problem-solving corner or bulletin board to stimulate student interest.

**Choose the operation** Determining if an answer will be greater or less than the greatest number in the problem will help students decide whether they will be estimating a sum or difference in Problems 25 and 26.

**Use physical models** For Problem 25, students may wish to use counters, putting the appropriate number on sheets of paper labeled Texas and Louisiana.

## Estimating Differences: Mental Math

In the mid-1950s, there were 479 pairs of Kirtland warblers found in North America. By the early 1970s, only 216 pairs could be found. About how many fewer pairs of Kirtland warblers were found in North America in the early 1970s?

Estimate  $479 - 216$ .

$$479 - 216$$

$$\begin{array}{r} 479 \\ - 216 \\ \hline 500 - 200 = 300 \end{array}$$

Round 479 and 216 to the nearest hundred. Then subtract.

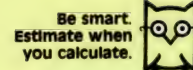
Actual difference

$$\begin{array}{r} 479 \\ - 216 \\ \hline 263 \end{array}$$

There were about 300 fewer pairs of Kirtland warblers in the early 1970s.



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## Practice 25

Name: \_\_\_\_\_

What can go through water and not get wet?

First estimate each difference. Each time an estimate is given in the code, write the letter for that estimate. Two answers are not used.

Actual sums are in parentheses. First round both numbers to the nearest ten.

1. $34 - 13$ <u>20</u> N	2. $78 - 22$ <u>60</u> (56) A	3. $49 - 37$ <u>10</u> (12) S
4. $149 - 51$ <u>100</u> (98) R	5. $168 - 77$ <u>90</u> (91) U	6. $58 - 21$ <u>40</u> (37) E

First round both numbers to the nearest hundred.

7. $688 - 123$ <u>600</u> (565) S	8. $495 - 172$ <u>300</u> (323) V	9. $269 - 110$ <u>200</u> (159) S
10. $1,186 - 813$ <u>400</u> (373) H	11. $1,821 - 910$ <u>900</u> (921) A	12. $799 - 317$ <u>500</u> (482) C

First round both numbers to the nearest thousand.

13. $5,824 - 2,613$ <u>3,000</u> (3,211) I	14. $6,717 - 1,504$ <u>5,000</u> (5,213) N
---	---

R A Y S OF S U N S H I N E

100	60	300	10	OF	600	90	20	200	400	3,000	5,000	40
-----	----	-----	----	----	-----	----	----	-----	-----	-------	-------	----

## Reteaching 25

Name: \_\_\_\_\_

Estimate  $39 - 12$ .

Round each number.

$39 - 12 = 30$  Subtract.

**Rounding Reminder:** Touch the digit in the place you are rounding to. Circle the digit to the right. If the digit you circled is 5 or greater, round up. If it is less than 5, round down.

Round each number to the nearest 10. Subtract.

1. $52 - 21$ <u>50</u> - <u>20</u> = <u>30</u>	2. $38 - 11$ <u>40</u> - <u>10</u> = <u>30</u>
3. $87 - 55$ <u>90</u> - <u>60</u> = <u>30</u>	4. $79 - 46$ <u>80</u> - <u>50</u> = <u>30</u>
5. $144 - 12$ <u>140</u> - <u>10</u> = <u>130</u>	6. $283 - 51$ <u>280</u> - <u>50</u> = <u>230</u>

Round each number to the nearest 100. Subtract.

7. $474 - 163$ <u>500</u> - <u>200</u> = <u>300</u>	8. $807 - 501$ <u>800</u> - <u>500</u> = <u>300</u>
9. $389 - 122$ <u>400</u> - <u>100</u> = <u>300</u>	10. $931 - 610$ <u>900</u> - <u>600</u> = <u>300</u>
11. $777 - 521$ <u>800</u> - <u>500</u> = <u>300</u>	12. $1,293 - 1,021$ <u>1,300</u> - <u>1,000</u> = <u>300</u>



### Actual differences are in parentheses.

**Try Estimation** Estimate each difference. First round both numbers to the given place.

- a.  $58 - 32$  (nearest ten)  
30 (26)
- b.  $847 - 115$  (nearest hundred)  
700 (732)
- c.  $5,727 - 4,025$  (nearest thousand)  
2,000 (1,702)
- d.  $148 - 43$  (nearest ten)  
110 (105)
- e.  $8,645 - 412$  (nearest hundred)  
8,200 (8,233)
- f.  $1,256 - 893$  (nearest hundred)  
400 (363)

**Practice Estimation** Estimate each difference.

Actual differences are in parentheses.

First round both numbers to the nearest ten.

1.  $59 - 17$   
40 (42)
2.  $79 - 32$   
50 (47)
3.  $48 - 22$   
30 (26)
4.  $84 - 21$   
60 (63)
5.  $67 - 42$   
30 (25)
6.  $38 - 13$   
30 (25)
7.  $142 - 31$   
110 (111)
8.  $179 - 74$   
110 (105)
9.  $197 - 76$   
120 (121)
10.  $186 - 51$   
140 (135)

First round both numbers to the nearest hundred.

11.  $863 - 202$   
700 (661)
12.  $487 - 153$   
300 (334)
13.  $654 - 103$   
600 (551)
14.  $328 - 214$   
100 (114)
15.  $1,336 - 215$   
1,100 (1,121)
16.  $1,564 - 463$   
1,100 (1,101)
17.  $1,792 - 681$   
1,100 (1,111)
18.  $1,846 - 523$   
1,300 (1,323)

First round both numbers to the nearest thousand.

19.  $7,846 - 2,635$   
5,000 (5,211)
20.  $1,985 - 1,213$   
1,000 (772)
21.  $5,468 - 4,467$   
1,000 (1,001)
22.  $4,673 - 1,051$   
4,000 (3,622)
23.  $6,095 - 2,032$   
4,000 (4,063)
24.  $8,500 - 2,500$   
6,000 (6,000)

Estimates are in parentheses.

**Apply Estimation** Solve each problem by finding the actual answer. Then estimate to see if your answer is reasonable.

25. In 1912, there were only 88 whooping cranes in Texas and Louisiana. 32 of them were in Louisiana. How many were in Texas?  
56 cranes ( $90 - 30 = 60$ )
26. In 1982, Hawaii had 27 kinds of endangered birds. The rest of the United States had 23 other kinds. How many kinds of endangered birds were in the entire United States in 1982? 50 kinds ( $30 + 20 = 50$ )
27. **Find the facts.** In Cary, a rally to save birds was attended by 4,120 of its citizens. Use data from the table on page 37 to tell about how many citizens did not attend.  
2,520 citizens ( $7,000 - 4,000 = 3,000$ )

More Practice Set 25, page 360 65

## Assignment Guide

basic 1–25 odd, 27  
average 1–25 odd, 26–27  
enriched 1–24 even, 25–27

More Practice Set 25,  
page 360

## Follow-Up

**Extra Practice** Use the exercises below to review rounding to tens, hundreds, or thousands.

$62 - 39$  [ $60 - 40 = 20$ ]  
 $27 - 15$  [ $30 - 20 = 10$ ]  
 $299 - 221$  [ $300 - 200 = 100$ ]  
 $796 - 169$  [ $800 - 200 = 600$ ]  
 $4,963 - 2,596$   
[ $5,000 - 3,000 = 2,000$ ]  
 $7,145 - 6,074$   
[ $7,000 - 6,000 = 1,000$ ]  
 $8,800 - 4,276$   
[ $9,000 - 4,000 = 5,000$ ]

You may also wish to adapt the game on pages 170–171 for use with this lesson.

**Reteaching** Students having difficulty rounding numbers should work number-line exercises. Have students draw their own number lines showing multiples of 10 on the board and then round several numbers such as 21, 56, and 83. Have students explain their work. Repeat with multiples of 100 and 1,000.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Addition and Subtraction 3, Activity 2

## Cooperative Learning Groups

See page 476 of this Teacher's Edition.

## Enrichment 25

Name \_\_\_\_\_ E25

**Make Up Your Own Game**

Jenny and Rico played a subtraction game. On each play they both drew 2 numbers. The one with the greatest difference got 1 point.

Estimate the differences to see who scored on each play. Circle the winning pair of cards.

Jenny Rico

1.  $294$   $180$   $671$   $261$
2.  $401$   $892$   $618$   $402$
3.  $314$   $527$   $243$   $896$
4.  $392$   $101$   $712$   $814$
5.  $976$   $413$   $598$   $286$

6. Who was winning after 5 plays? Jenny

Make a set of cards and play this game with a friend.

989 878 102 77 34

## Additional Resource 25

Name \_\_\_\_\_ Additional Resource 25

**Project Calendar Patterns**

Materials needed: an old calendar.

In this project, you will experiment with squares of numbers on a calendar.

1. Add the numbers in opposite corners of the square drawn on the calendar at the right.  
 $2 + 10 = 12$   
 $3 + 9 = 12$
2. What do you notice about the sums?  
They are the same.
3. Use an old calendar and pick a month. Draw three squares like the one above, using different numbers. Add the numbers in opposite corners of each square. Answers will vary. Sample answers are given.  
Square 1:  $11 + 19 = 30$   $12 + 18 = 30$   
Square 2:  $14 + 22 = 36$   $15 + 21 = 36$   
Square 3:  $18 + 26 = 44$   $19 + 25 = 44$
4. For each square, are the sums of the numbers in the opposite corners the same? Yes
5. Pick another month in your calendar. Find squares with three numbers along each side. Add the numbers in opposite corners. What do you find?  
The sums are the same.

Su	M	Tu	W	Th	F	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

## Daily Maintenance

**Estimation** Estimate each sum. First round each number to the nearest ten.

1.  $15 + 11$  [30]
2.  $62 + 16$  [80]
3.  $41 + 52$  [90]
4.  $63 + 86$  [150]
5.  $51 + 638$  [690]
6.  $308 + 89$  [400]



## Objective 26

Rename numbers with up to four digits to show more hundreds, tens, or ones.

### Materials

- Place-Value Charts (Teaching Aid C)
- Common objects
- Play money: \$100, \$10, and \$1
- Cards (See Reteaching.)

## Introduction

**Using Concrete Materials** Individually or in groups, have students use 2 hundred-dollar bills, 6 ten-dollar bills, and 3 one-dollar bills (play money), to represent \$263. Write 263 on the chalkboard in a place-value chart. Have the students rename this amount to show 10 more one-dollar bills. [2 hundred-dollar bills, 5 ten-dollar bills, and 13 one-dollar bills] Using the original amount, have students rename to show 10 more ten-dollar bills. [1 hundred-dollar bill, 16 ten-dollar bills, and 3 one-dollar bills].

## Using the Pages

**Teach** Read and discuss the examples. As you work through each step of the renaming, write it on the board.

**Practice** Exercises 5, 11, and 12 require two renamings.

**Apply Problem Solving** Encouraging creative thinking rather than correct solutions will help students improve their problem-solving skills.

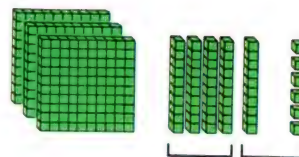
**Use physical models** Let students use objects to demonstrate Problems 16 and 17.

**Choosing a computation method** Read these problems to students and have them choose whether to estimate or to compute an exact answer.

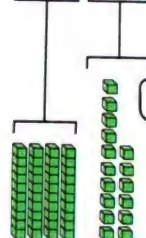
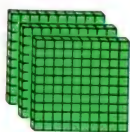
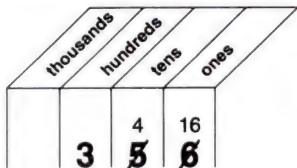
1. The three fourth-grade classes checked 37, 29, and 34 books out of the library. About how many books were checked out by the three classes? [About 100]
2. This year 214 students joined after-school activities. This is 89 more than last year. How many students joined after-school activities last year? [125 students]

## Renaming for Subtraction

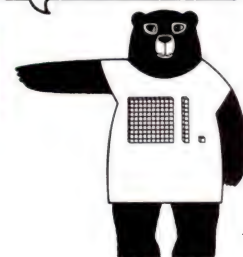
- A.** Rename 356 to show 10 more ones.



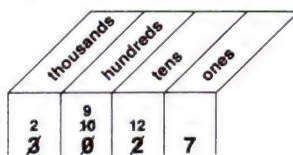
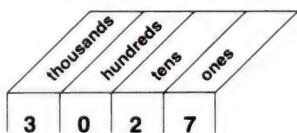
1 ten is 10 ones.  
There are 16 ones in all.



Remember hundreds, tens, and ones, and you'll understand how it's done.

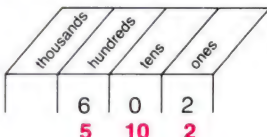


- B.** Rename 3,027 to show 10 more tens.

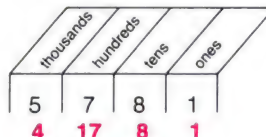


**Try** Rename to show

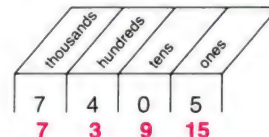
- a.** 10 more tens.



- b.** 10 more hundreds.



- c.** 10 more ones.



## Practice 26

Name \_\_\_\_\_ P26

Rename to show 10 more ones.

1. 

thousands	hundreds	tens	ones
	6	0	2
2. 

thousands	hundreds	tens	ones
	6	14	4
3. 

thousands	hundreds	tens	ones
	7	10	0
4. 

thousands	hundreds	tens	ones
3	9	4	16
5. 

thousands	hundreds	tens	ones
6	9	18	8
6. 

thousands	hundreds	tens	ones
3	9	10	0

Rename to show 10 more tens.

7. 

thousands	hundreds	tens	ones
2	16	2	2
8. 

thousands	hundreds	tens	ones
6	9	12	5
9. 

thousands	hundreds	tens	ones
7	10	0	6

Rename to show 10 more hundreds.

10. 

thousands	hundreds	tens	ones
4	14	3	2
11. 

thousands	hundreds	tens	ones
2	10	1	5
12. 

thousands	hundreds	tens	ones
0	13	6	6

## Reteaching 26

Name \_\_\_\_\_ R26

Rename 34 to show 10 more ones.

1 ten = 10 ones

3 4

Rename to show 10 more ones.

1. 

thousands	hundreds	tens	ones
	3	4	
2. 

thousands	hundreds	tens	ones
	1	13	4
3. 

thousands	hundreds	tens	ones
	4	16	4
4. 

thousands	hundreds	tens	ones
	7	19	4
5. 

thousands	hundreds	tens	ones
	4	14	4
6. 

thousands	hundreds	tens	ones
	2	0	1

Rename to show 10 more tens.

7. 

thousands	hundreds	tens	ones
	3	16	4
8. 

thousands	hundreds	tens	ones
	6	12	4
9. 

thousands	hundreds	tens	ones
	7	2	4

Rename to show 10 more hundreds.

10. 

thousands	hundreds	tens	ones
	7	14	4
11. 

thousands	hundreds	tens	ones
	1	9	16
12. 

thousands	hundreds	tens	ones
	6	9	19



## Assignment Guide

basic 1–16  
average 1–17  
enriched 1–17

**More Practice Set 26,**  
page 361

## Follow-Up

**Extra Practice** Have students rename Exercises 3–6 to show 10 more tens, Exercises 10–12 to show 10 more hundreds, and Exercises 7–15 to show 10 more ones.

**Reteaching** For those having difficulty renaming, prepare two sets of 20 cards each. Mark the first set with numbers such as 762 written in place-value boxes. Mark the second set with numbers which, when correctly renamed, match a number in the first set, such as 6 hundreds, 16 tens, and 2 ones. Display a card from the second set and have students draw one card at a time from the first set until they match it.

**Enrichment** Have students explore how to rename 1,000 to show 10 more ones.

## Calculator

**Choosing a Computation Method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choices.

1.  $40 + 65$  [105]
2.  $92 + 38 + 61$  [191]
3.  $4,921 + 876 + 503$  [6,300]
4.  $4 + 5 + 6 + 10$  [25]
5.  $220 + 357$  [577]
6.  $427 + 805 + 36$  [1,268]

## Reading and Writing Mathematics

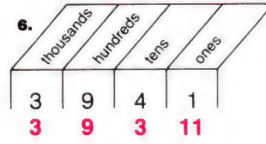
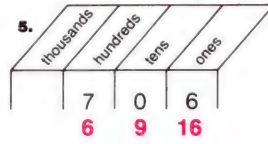
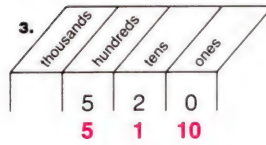
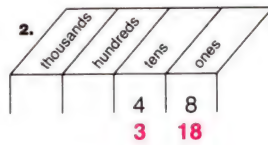
Have students fill in the blanks using these words: difference, sum, addend. In  $21 - 18 = 3$  and  $20 + 19 = 39$ , 39 is a [sum], 19 is an [addend], and 3 is a [difference].

## Daily Maintenance

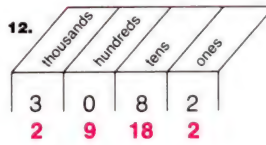
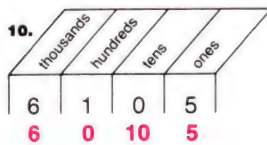
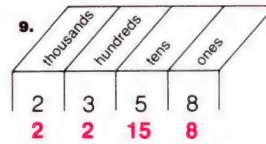
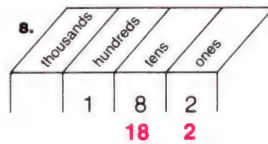
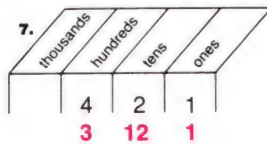
**Mental Math** Have students answer these exercises orally.

1.  $9 - 2$  [7]
2.  $8 - 5$  [3]
3.  $6 - 4$  [2]
4.  $10 - 1$  [9]
5.  $15 - 7$  [8]
6.  $13 - 8$  [5]

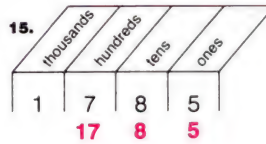
**Practice** Rename to show 10 more ones.



Rename to show 10 more tens.



Rename to show 10 more hundreds.



**Apply** Solve each problem.

16. Tom had 6 bunches of 10 roses and 5 single roses. He took one bunch of 10 roses and put them with the single roses. Then how many bunches of 10 and single roses did he have? **5 bunches of 10 and 15 single roses**

17. Tom had 2 boxes of 100 tulip bulbs and 4 bags of 10 bulbs. He took 100 bulbs from one box and put them into bags of 10. Then how many boxes of 100 and bags of 10 did he have? **1 box of 100 and 14 bags of 10 bulbs**

More Practice Set 26, page 361 67

## Enrichment 26

Name \_\_\_\_\_ E26

**Some Subtraction Puzzles**

Complete these subtraction boxes by subtracting across and down.

6,492	-	2,137	=	4,355
1,820	-	1,206	=	614
4,672	-	931	=	3,741


  

9,688	-	4,931	=	4,757
3,203	-	1,029	=	2,174
6,485	-	3,902	=	2,583

Fill in the missing numbers in these subtraction boxes.

8,426	-	2,152	=	6,274
3,109	-	1,037	=	2,072
5,317	-	1,115	=	4,202



## Additional Resource 26

Name \_\_\_\_\_ Additional Resource 26

**Maintenance**

Write each family of facts.

- $4 + 7 = 11$   
 $7 + 4 = 11$   
 $11 - 7 = 4$   
 $11 - 4 = 7$
- $12 - 5 = 7$   
 $12 - 7 = 5$   
 $7 + 5 = 12$   
 $5 + 7 = 12$
- $6 + 9 = 15$   
 $9 + 6 = 15$   
 $15 - 6 = 9$   
 $15 - 9 = 6$
- $4 + 8 = 12$   
 $8 + 4 = 12$   
 $12 - 4 = 8$   
 $12 - 8 = 4$
- $4 + 6 = 10$   
 $6 + 4 = 10$   
 $10 - 6 = 4$   
 $10 - 4 = 6$
- $17 - 9 = 8$   
 $17 - 8 = 9$   
 $9 + 8 = 17$   
 $8 + 9 = 17$
- $9 + 9 = 18$   
 $18 - 9 = 9$
- $12 - 6 = 6$   
 $6 + 6 = 12$
- $7 + 7 = 14$   
 $14 - 7 = 7$
- $16 - 8 = 8$   
 $8 + 8 = 16$



## Objective 27

Subtract numbers with up to four digits with one renaming.

### Lesson Theme

Recreation: Zoo

### Materials

- Computation squares (Teaching Aid D)
- Play money: \$10, and \$1

## Introduction

**Using Concrete Materials** Have each student display 45 dollars in play money (4 ten-dollar bills and 5 one-dollar bills). Write  $45 - 27$  in a place-value box on the board.

t	o	t	o
4	5	3	15
-2	7	<del>4</del>	<del>8</del>
		-2	7
		1	8

Students should exchange 1 ten-dollar bill for 10 one-dollar bills. Have a student show this renaming in the place-value box. Students can now remove 7 one-dollar bills and 2 ten-dollar bills. Finish the subtraction at the board.

## Using the Pages

**Teach** Discuss why the numbers in the example are rounded to the nearest ten. [If they were rounded to the nearest hundred, both numbers would round to 100 giving an estimate of 0.]

Use a place-value box to show the renaming in the example and in the following exercises:

$$43 - 26 \quad [17]$$

$$8,247 - 3,128 \quad [5,119]$$

As students recognize that 17 is a reasonable answer, discuss how estimation before computing is useful. [Comparing the actual answer with an estimation is a way of determining the reasonableness of the answer.]

**Try** For Exercise e, encourage students to think in terms of reasonableness of the exact answer as compared to the estimated answer.

### Practice Choosing a computation method

Before students begin Exercises 9–17, have them consider which exercises they would compute with pencil and paper rather than enter into a calculator. [Answers will vary.]

**Mental Math** After students have completed Exercises 18–24, have them discuss the strategies that they used. See pages 444–445 in this Teacher's Edition.

(Continued on page 69.)

## Subtraction: One Renaming

The National Zoo in Washington, D.C., has two giant pandas. The male weighs 126 kilograms. The female weighs 109 kilograms. How much more does the male weigh than the female?

Find  $126 - 109$ . Estimate the difference by rounding each number to the nearest ten.  $130 - 110 =$  **20**

Rename to show 10 more ones.

$$\begin{array}{r} 1 \text{ } 16 \\ 12\cancel{6} \\ -109 \\ \hline \end{array} \quad \begin{array}{l} 2 \text{ tens } 6 \text{ ones} = \\ 1 \text{ ten } 16 \text{ ones} \end{array}$$

Subtract the ones.

$$\begin{array}{r} 1 \text{ } 16 \\ 12\cancel{6} \\ -109 \\ \hline 7 \end{array}$$

Subtract the tens. Subtract the hundreds. There are no hundreds left.

$$\begin{array}{r} 1 \text{ } 16 \\ 12\cancel{6} \\ -109 \\ \hline 17 \end{array}$$

The male panda weighs 17 kilograms more than the female. Check to see if the exact answer is close to the estimate. Why is it important to estimate before you subtract? **An estimated answer will help you decide if the actual answer is reasonable.**

**Try** For exercises a–d, estimate each difference. Then subtract to find the exact answer and compare it to your estimate to see if your answer is reasonable.

a.  $\begin{array}{r} 84 \\ -37 \\ \hline 47 \end{array}$

b.  $\begin{array}{r} 624 \\ -372 \\ \hline 252 \end{array}$

c.  $\begin{array}{r} 8,435 \\ -5,183 \\ \hline 3,252 \end{array}$

d.  $245 - 26$   
**219**

- e. Suppose you estimate an answer to a subtraction problem to be 7,600 and when you subtract you get an exact answer of 6,567. Is your answer reasonable? Why or why not?

**See margin.**

**Practice** Subtract.

1.  $\begin{array}{r} 54 \\ -27 \\ \hline 27 \end{array}$

2.  $\begin{array}{r} 97 \\ -59 \\ \hline 38 \end{array}$

3.  $\begin{array}{r} 90 \\ -64 \\ \hline 26 \end{array}$

4.  $\begin{array}{r} 927 \\ -681 \\ \hline 246 \end{array}$

5.  $\begin{array}{r} 763 \\ -427 \\ \hline 336 \end{array}$

6.  $\begin{array}{r} 635 \\ -250 \\ \hline 385 \end{array}$

7.  $\begin{array}{r} 7,634 \\ -6,182 \\ \hline 1,452 \end{array}$

8.  $\begin{array}{r} 9,147 \\ -5,643 \\ \hline 3,504 \end{array}$

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## Practice 27

When does a bridge get angry?

To find out, subtract. Find each answer below. Write the letter for that exercise. Some answers are not used.

1.  $\begin{array}{r} 34 \\ -29 \\ \hline 5 \end{array}$  M

2.  $\begin{array}{r} 52 \\ -15 \\ \hline 37 \end{array}$  E

3.  $\begin{array}{r} 76 \\ -29 \\ \hline 47 \end{array}$  G

4.  $\begin{array}{r} 40 \\ -27 \\ \hline 13 \end{array}$  R

5.  $\begin{array}{r} 82 \\ -48 \\ \hline 34 \end{array}$  U

6.  $\begin{array}{r} 364 \\ -81 \\ \hline 283 \end{array}$  T

7.  $\begin{array}{r} 723 \\ -173 \\ \hline 550 \end{array}$  S

8.  $\begin{array}{r} 462 \\ -125 \\ \hline 337 \end{array}$  H

9.  $\begin{array}{r} 680 \\ -244 \\ \hline 436 \end{array}$  E

10.  $\begin{array}{r} 830 \\ -519 \\ \hline 311 \end{array}$  S

11.  $\begin{array}{r} 428 \\ -173 \\ \hline 255 \end{array}$  T

12.  $\begin{array}{r} 614 \\ -152 \\ \hline 462 \end{array}$  I

13.  $\begin{array}{r} 5645 \\ -564 \\ \hline 5081 \end{array}$  S

14.  $\begin{array}{r} 4417 \\ -1603 \\ \hline 2814 \end{array}$  N

15.  $\begin{array}{r} 5678 \\ -2487 \\ \hline 3191 \end{array}$  S

16.  $\begin{array}{r} 4513 \\ -2611 \\ \hline 1902 \end{array}$  O

17.  $\begin{array}{r} 9108 \\ -2136 \\ \hline 6972 \end{array}$  O

18.  $\begin{array}{r} 3835 \\ -3619 \\ \hline 216 \end{array}$  W

19.  $\begin{array}{r} 537 \\ -28 \\ \hline 509 \end{array}$  I

20.  $\begin{array}{r} 418 \\ -43 \\ \hline 375 \end{array}$  C

When **S O E T H I N G**

**C R O S S E S I T**

375 13 1902 311 707 436 3191 509 216

## Reteaching 27

Find  $75 - 29$ .

Rename 1 ten as 10 ones.

Subtract the ones.

Subtract the tens.

What happened in a baseball game played in 1929 by the Philadelphia Phillies and Pittsburgh Pirates?

Subtract. Write the letters for the answers in the blanks below.

Answers may be used more than once.

1.  $\begin{array}{r} 84 \\ -57 \\ \hline 27 \end{array}$  A

2.  $\begin{array}{r} 75 \\ -29 \\ \hline 46 \end{array}$  U

3.  $\begin{array}{r} 86 \\ -29 \\ \hline 57 \end{array}$  R

4.  $\begin{array}{r} 37 \\ -18 \\ \hline 19 \end{array}$  Y

5.  $\begin{array}{r} 72 \\ -43 \\ \hline 29 \end{array}$  E

6.  $\begin{array}{r} 542 \\ -316 \\ \hline 226 \end{array}$  H

7.  $\begin{array}{r} 453 \\ -124 \\ \hline 329 \end{array}$  N

8.  $\begin{array}{r} 468 \\ -39 \\ \hline 429 \end{array}$  G

9.  $\begin{array}{r} 639 \\ -257 \\ \hline 382 \end{array}$  V

10.  $\begin{array}{r} 347 \\ -162 \\ \hline 185 \end{array}$  O

11.  $\begin{array}{r} 935 \\ -240 \\ \hline 695 \end{array}$  M

12.  $\begin{array}{r} 739 \\ -560 \\ \hline 179 \end{array}$  N

13.  $\begin{array}{r} 738 \\ -96 \\ \hline 642 \end{array}$  N

14.  $\begin{array}{r} 316 \\ -84 \\ \hline 232 \end{array}$  I

15.  $\begin{array}{r} 226 \\ -35 \\ \hline 191 \end{array}$  E

16.  $\begin{array}{r} 487 \\ -96 \\ \hline 391 \end{array}$  I

When **H O M E R U N I N**

**E V E R Y I N N I N G**

27 226 185 695 29 57 37 642 232 329 191 382 29 57 19 391 642 329 232 179 429



Subtract. Choose a method to find each answer.

Tell which method you used.

9.  $734 - 61$  **673; P**    10.  $6,735 - 392$  **6,343; P**    11.  $4,375 - 854$  **3,521; P**    12.  $8,763 - 239$  **8,524; P**    13.  $5,327 - 1,152$  **4,175; P**
14.  $250 - 136$  **114; P**    15.  $4,137 - 1,029$  **3,108; P, C**    16.  $2,738 - 1,654$  **1,084; P, C**    17.  $826 - 54$  **772; P**

**Mental math** Subtract mentally. Write only the difference.

18.  $8,000 - 6,000$  **2,000**    19.  $572 - 300$  **272**    20.  $98 - 45$  **53**    21.  $731 - 401$  **330**    22.  $9,865 - 7,000$  **2,865**    23.  $50 - 20$  **30**    24.  $800 - 700$  **100**

**Apply** Solve each problem.

25. The two giant pandas arrived at the National Zoo in 1972. The zoo had opened 82 years earlier. In what year did the National Zoo open?

**1890**

26. **Estimation** The National Zoo covers an area of 173 acres. The St. Louis Zoo covers an area of 83 acres. Estimate how many more acres are covered by the National Zoo than by the St. Louis Zoo. First round both numbers to the nearest ten.

**90 more acres**

27. Let  $a$  be any number. Choose a number for  $b$  so that  $b$  is less than  $a$ . Put your numbers in the sentences below. **See Using the Pages.**

$$a + b = b + a \quad a - b = b - a$$

Are both of the sentences true?

Explain why or why not.

What can you say about the

sentences when  $a$  and  $b$  are equal?



## Assignment Guide

basic	1–27 odd
average	1–24 even, 25–27
enriched	1–27

**More Practice Set 27, Page 361**

**Homework to do with others** Using numbers 1 to 9, tell each student to think of three different numbers whose sum is fifteen. Have each student discuss with another person the strategies that might help determine if theirs is the only solution. Tell students to bring to class a copy of their original solution and all other solutions they found with the help of the other person.

(Continued from page 68.)

**Apply Problem Solving** For Problem 27, students will discover that both number sentences are not true because commutativity does not apply to subtraction. If  $a$  and  $b$  are equal, both sentences are true.

**Use logical thinking** Ask students to suggest a way to solve the following problem: "How old is the National Zoo now?" [One way is to subtract the year the zoo was opened, 1890, from the present year.] Then have them solve the problem.

Have students look up the commutative property of addition in the Glossary at the back of their books.

## Follow-Up

**Enrichment** Have students research how an abacus employs the renaming principle for subtraction.

## Computer Assisted Instruction

Mathematics Courseware Series

- Addition and Subtraction 3, Activities 5, 7

## Daily Maintenance

Round each number to the nearest hundred.

1. 358 [400]    2. 2,964 [3,000]  
3. 3,506 [3,500]    4. 1,249 [1,200]  
5. 6,385 [6,400]

**Answers, page 68**

- e. **No.** Having an estimated answer of 7,600 indicates the numbers in the subtraction problem were rounded at most to the nearest hundred. The exact answer should not be different by 1,000. Either the estimated difference is incorrect or the actual answer is wrong. You should check your work.

## Enrichment 27

Flow Charts II E27

Follow the directions given in these flow charts. Write your final answer in the circle.

1.  $9,285 - 3,614 - 2,538$  **3,133**

2.  $4,725 - 1,264 + 4,295$  **7,756**

3.  $8,992 - 1,217$  **Less than 2,000?** **yes** **1,690**  
no

4.  $9,389 - 1,812$  **Less than 2,000?** **yes** **329**  
no

Use the numbers on the right in order as you follow the next flow chart.

5. Get this first input **7,256** **3,814** **1,071** **1,850** **2,319**  
Subtract the next input **Less than 2,000?** **yes** **521**  
no

## Additional Resource 27

Additional Resource 27

Calculator Find the Rule

Bill gave this list of numbers and asked Maria to tell what rule was used each time to get the next number.

11 9 7 5 3 1

Use me to find the rule.

Subtract each number from the one before it.

11 ☐ 9 ☐ 2  
9 ☐ 7 ☐ 2  
7 ☐ 5 ☐ 2  
5 ☐ 3 ☐ 2  
3 ☐ 1 ☐ 2

Each number is 2 less than the number before it.  
The rule is ☐ 2 ☐

Use your calculator to play "Find the Rule." Fill in the missing numbers and give the rule.

Number list Rule

1. 38 31 24 17 10 3  **$-7 =$**

2. 279 266 253 240 227 214  **$-13 =$**

3. 246 218 190 162 134 106  **$-28 =$**

4. 145 118 91 64 37 10  **$-7 =$**

5. 17 14 11 8 5 2  **$-3 =$**



**Objective 28** (Target Objective)  
Subtract numbers with up to four digits with more than one renaming.

### Lesson Theme

Recreation: Zoo

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- 10 cards (0–9)

### Introduction

**Using Concrete Materials** Use counters to extend the concept of renaming in subtraction to include more than one renaming. Have several students use 3 hundred-squares, 4 ten-sticks, and 6 units to demonstrate  $346 - 158$ . [188]

**Warm-Up Review** Review subtracting numbers with one renaming. Write each of the following exercises in a place-value box and subtract:  $618 - 345$  [273] and  $786 - 48$  [738].

### Using the Pages

**Teach** Write the example on the board in a place-value box. Show each step.

Step 1			Step 2		
h	t	o	h	t	o
3	0	15	2	10	15
-1	6	7	-1	6	7
			1	4	8

Other teaching examples:

$$\begin{array}{r} 5,244 \\ - 2,718 \\ \hline 2,526 \end{array} \quad \begin{array}{r} 812 \\ - 496 \\ \hline 316 \end{array}$$

**Try Error Analysis** Watch for students who subtract a lesser digit in the top number from a greater one below. Allow students who make this error to use counters or other objects until they understand the process.

**Apply Problem Solving** Reading and hearing problems read aloud can help students improve their problem-solving skills.

**Multiple-step** As students read Problem 20, have them discuss the ways in which they could solve it. [They could add and then subtract, or they could subtract twice.]

**Use logical thinking** If students need help with Problem 21, tell them to start by thinking, " $49 + \text{■} = 98$ " and " $49 + \text{■} = 129$ ."

### Subtraction: More Than One Renaming

Laurie and Jennifer Takata went to the zoo in their city. They saw 315 mammals and 167 birds. How many more mammals did they see than birds?

Find  $315 - 167$ .

Estimate using rounding:  
 $300 - 200 = 100$

Rename to show 10 more ones. Subtract the ones.

$$\begin{array}{r} 0 \quad 15 \\ 3 \cancel{1} \cancel{5} \\ - 1 \quad 6 \quad 7 \\ \hline 8 \end{array}$$

1 ten 5 ones = 0 tens 15 ones

Rename to show 10 more tens. Subtract the tens.

$$\begin{array}{r} 2 \quad 10 \quad 15 \\ 3 \cancel{1} \cancel{5} \\ - 1 \quad 6 \quad 7 \\ \hline 4 \quad 8 \end{array}$$

3 hundreds 0 tens = 2 hundreds 10 tens

Subtract the hundreds.

$$\begin{array}{r} 2 \quad 10 \quad 15 \\ 3 \cancel{1} \cancel{5} \\ - 1 \quad 6 \quad 7 \\ \hline 1 \quad 4 \quad 8 \end{array}$$

Laurie and Jennifer saw 148 more mammals than birds.

**Try Subtract.**

a.  $\begin{array}{r} 736 \\ - 349 \\ \hline 387 \end{array}$  b.  $\begin{array}{r} 8,127 \\ - 675 \\ \hline 7,452 \end{array}$  c.  $\begin{array}{r} 7,194 \\ - 1,856 \\ \hline 5,338 \end{array}$  d.  $\begin{array}{r} 340 \\ - 93 \\ \hline 247 \end{array}$



### Practice 28

Name \_\_\_\_\_ P28

Subtract.

- $\begin{array}{r} 432 \\ - 48 \\ \hline 384 \end{array}$
- $\begin{array}{r} 624 \\ - 56 \\ \hline 568 \end{array}$
- $\begin{array}{r} 525 \\ - 47 \\ \hline 478 \end{array}$
- $\begin{array}{r} 240 \\ - 81 \\ \hline 159 \end{array}$
- $\begin{array}{r} 362 \\ - 273 \\ \hline 89 \end{array}$
- $\begin{array}{r} 725 \\ - 528 \\ \hline 197 \end{array}$
- $\begin{array}{r} 451 \\ - 265 \\ \hline 186 \end{array}$
- $\begin{array}{r} 738 \\ - 639 \\ \hline 99 \end{array}$
- $\begin{array}{r} 4632 \\ - 804 \\ \hline 3828 \end{array}$
- $\begin{array}{r} 6275 \\ - 793 \\ \hline 5482 \end{array}$
- $\begin{array}{r} 3842 \\ - 936 \\ \hline 2906 \end{array}$
- $\begin{array}{r} 5635 \\ - 537 \\ \hline 5098 \end{array}$
- $\begin{array}{r} 2053 \\ - 448 \\ \hline 1605 \end{array}$
- $\begin{array}{r} 5678 \\ - 3289 \\ \hline 2389 \end{array}$
- $\begin{array}{r} 4356 \\ - 1584 \\ \hline 2772 \end{array}$
- $\begin{array}{r} 7206 \\ - 3712 \\ \hline 3494 \end{array}$
- $3.672 - 1.908 = 1.764$
- $735 - 66 = 669$

Solve each problem.

19. A school has 482 students. On Monday, 93 students were absent. How many were present?  
389 students

20. Tommy has 411 baseball cards. If he gives away 54 cards, how many will he have left?  
357 cards

*Coach Kildar, Joe Fabel, Henry Dearth, Jorge Virella, Sally Klemm*

### Reteaching 28

Name \_\_\_\_\_ R28

Find  $424 - 186$ .

Rename 1 ten as 10 ones.

Subtract.

$$\begin{array}{r} 1 \quad 14 \\ 4 \quad 2 \quad 4 \\ - 1 \quad 8 \quad 6 \\ \hline 2 \quad 3 \quad 8 \end{array}$$

Rename 1 hundred as 10 tens.

$$\begin{array}{r} 3 \quad 11 \quad 14 \\ 4 \quad 2 \quad 4 \\ - 1 \quad 8 \quad 6 \\ \hline 2 \quad 3 \quad 8 \end{array}$$

Subtract.

$$\begin{array}{r} 1 \quad 4 \quad 7 \\ - 2 \quad 9 \\ \hline 1 \quad 8 \end{array} \quad \begin{array}{r} 2 \quad 5 \quad 4 \quad 7 \\ - 3 \quad 2 \quad 9 \\ \hline 2 \quad 1 \quad 1 \quad 8 \end{array} \quad \begin{array}{r} 3 \quad 5 \quad 4 \quad 7 \\ - 3 \quad 6 \quad 9 \\ \hline 1 \quad 1 \quad 5 \quad 8 \end{array}$$

$$\begin{array}{r} 4 \quad 6 \quad 1 \\ - 1 \quad 3 \\ \hline 4 \quad 8 \end{array} \quad \begin{array}{r} 5 \quad 8 \quad 6 \quad 1 \\ - 4 \quad 1 \quad 3 \\ \hline 4 \quad 4 \quad 8 \end{array} \quad \begin{array}{r} 6 \quad 8 \quad 6 \quad 1 \\ - 4 \quad 7 \quad 3 \\ \hline 3 \quad 8 \quad 8 \end{array}$$

$$\begin{array}{r} 7 \quad 9 \quad 2 \quad 4 \\ - 5 \quad 6 \\ \hline 8 \quad 6 \quad 8 \end{array} \quad \begin{array}{r} 8 \quad 6 \quad 4 \quad 3 \\ - 7 \quad 8 \\ \hline 7 \quad 7 \quad 8 \end{array} \quad \begin{array}{r} 9 \quad 9 \quad 4 \quad 5 \\ - 1 \quad 6 \quad 7 \\ \hline 7 \quad 7 \quad 8 \end{array}$$

$$\begin{array}{r} 10 \quad 7 \quad 6 \quad 3 \\ - 4 \quad 9 \quad 5 \\ \hline 2 \quad 1 \quad 6 \quad 8 \end{array} \quad \begin{array}{r} 11 \quad 4 \quad 1 \quad 6 \\ - 2 \quad 5 \quad 8 \\ \hline 2 \quad 5 \quad 8 \end{array} \quad \begin{array}{r} 12 \quad 9 \quad 6 \quad 5 \quad 8 \\ - 2 \quad 3 \quad 7 \quad 2 \\ \hline 7 \quad 2 \quad 7 \quad 1 \end{array}$$

I'm in every answer.

I'll help you with this one.



basic 1–9, 10–19 odd  
average 1–14, 17–19  
enriched 1–6 even, 7–21

**Practice Subtract.**

1.  $\begin{array}{r} 543 \\ - 76 \\ \hline 467 \end{array}$
2.  $\begin{array}{r} 350 \\ - 65 \\ \hline 285 \end{array}$
3.  $\begin{array}{r} 817 \\ - 429 \\ \hline 388 \end{array}$
4.  $\begin{array}{r} 450 \\ - 179 \\ \hline 271 \end{array}$
5.  $\begin{array}{r} 684 \\ - 288 \\ \hline 396 \end{array}$
6.  $\begin{array}{r} 8,157 \\ - 663 \\ \hline 7,494 \end{array}$
7.  $\begin{array}{r} 5,975 \\ - 678 \\ \hline 5,297 \end{array}$
8.  $\begin{array}{r} 2,597 \\ - 789 \\ \hline 1,808 \end{array}$
9.  $\begin{array}{r} 6,783 \\ - 1,975 \\ \hline 4,808 \end{array}$
10.  $\begin{array}{r} 7,194 \\ - 1,857 \\ \hline 5,337 \end{array}$
11.  $\begin{array}{r} 732 \\ - 67 \\ \hline 665 \end{array}$
12.  $\begin{array}{r} 852 \\ - 496 \\ \hline 356 \end{array}$
13.  $340 - 68 = 272$
14.  $3,192 - 275 = 2,917$
15.  $4,255 - 1,718 = 2,537$
16.  $6,718 - 3,826 = 2,892$

**Apply Solve each problem.**

17. The zoo has 173 birds. Of these, 19 are parrots. How many birds other than parrots are there?  
**154 birds**
18. On Saturday, 6,145 people visited the zoo. On Sunday, 1,387 fewer people came than on Saturday. How many people came on Sunday?  
**4,758 people**
19. **Estimation** The zoo aquarium has 38 fish that live in fresh water and 53 fish that live in salt water. About how many fish does the zoo aquarium have in all? Choose the best estimate.

80 90 100

**90**

- \*20. The zoo has 43 ducks in its duck pond. 17 of the ducks are mallards, and 12 of them are wood ducks. How many other ducks are in the pond?

**14 ducks**

21. **Thinking skills** Fill in the missing numbers in the addition square.

49	80	129
49	69	118
98	149	247

Round each number to the nearest ten.

1. 48 **50**
2. 172 **170**
3. 315 **320**
4. 87 **90**
5. 91 **90**
6. 624 **620**

Round each number to the nearest hundred.

7. 819 **800**
8. 493 **500**
9. 125 **100**
10. 657 **700**
11. 2,572 **2,600**
12. 1,209 **1,200**

Round each number to the nearest thousand.

13. 3,416 **3,000**
14. 6,540 **7,000**
15. 7,381 **7,000**
16. 1,253 **1,000**
17. 2,940 **3,000**
18. 4,286 **4,000**

Compare the numbers. Use < or >.

19. 65 **>** 57
20. 76 **<** 93
21. 352 **<** 355
22. 849 **>** 846
23. 1,048 **<** 1,163
24. 6,281 **<** 6,820

Using Problem-Solving Strategies, page 415  
More Practice Set 28, page 362 **71**

**More Practice Set 28, page 362**

**Follow-Up**

**Extra Practice** Use a set of 10 cards, each card having one of the digits 0–9 on it. Students pick six cards to make up two three-digit numbers. The first card picked is the digit that tells how many ones, the second tells how many tens, and the third tells how many hundreds. A zero picked for hundreds is eliminated (045 becomes 45). Students write down the numbers and subtract the lesser one from the greater one. The student having the greater answer gets one point. The first student to get 10 points is the winner. You may wish to have students check answers by using a calculator.

**Reteaching Using Concrete Materials**

Students having difficulty should do more renaming using objects for regrouping. Exercises could then be worked at the board, first with place-value boxes and then without the place-value boxes.

**Enrichment 28**

Name \_\_\_\_\_ E28

**Score a Contest**

Mrs. Nester's class had a reading contest. The table shows the number of pages read by the top four readers.

Student	Adventure	Science Fiction	Real Life
Frank	956	245	51
Arlene	837	62	486
Bridget	356	811	367
Donald	746	634	1,352

1. Frank read more pages of adventure than Arlene. How many more pages was this?  
**119 pages**
2. How many more pages of science fiction did Donald read than Frank?  
**389 more pages**
3. Bridget read more science fiction than Donald. How many more pages was this?  
**177 more pages**
4. Who read more real life, Donald or Arlene? How many more pages was this?  
**Donald 866 pages**
5. How many total pages did Arlene read?  
**1,385 pages**
6. Who read more total pages, Frank or Bridget? How many more pages was this?  
**Bridget 282 pages**
7. How many pages of adventure did all 4 students read?  
**2,895 pages**
8. Did the 4 students read more real life or science fiction? How many more pages was this?  
**real life 504 pages**
9. Who won the contest? **Donald**

**Additional Resource 28**

Name \_\_\_\_\_ Additional Resource 28

**Mental Math Simple Subtraction with Zeros**

To subtract numbers ending in 0s, think about 10s.

120 – 50  
12 tens – 5 tens  
7 tens or 70

Subtract mentally.

1. 90 – 30 = **60**
2. 140 – 70 = **70**
3. 80 – 20 = **60**
4. 110 – 70 = **40**
5. 130 – 40 = **90**
6. 150 – 10 = **140**
7. 110 – 60 = **50**
8. 120 – 50 = **70**
9. 140 – 70 – 30 = **40**
10. 150 – 70 – 30 = **50**
11. 150 – 90 – 60 = **0**
12. 180 – 90 – 80 = **10**
13. 400 – 200 = **200**
14. 500 – 400 = **100**
15. 800 – 200 – 300 = **300**
16. 900 – 500 – 200 = **200**
17. 1,400 – 800 = **600**
18. 1,700 – 800 = **900**
19. 1,600 – 800 = **800**
20. 1,200 – 700 = **500**
21. 1,500 – 900 = **600**
22. 1,400 – 500 = **900**

**Daily Maintenance**

**Choosing a Computation Method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

1. 426 – 321 [105]
2. 82 + 39 + 64 [185]
3. 13 – 9 [4]
4. 87 – 42 [45]
5. 143 + 27 [170]
6. 9 + 8 [17]

**Using Problem-Solving Strategies, page 415**



## Objective 29

Subtract numbers with up to four digits involving consecutive renamings with zeros.

### Lesson Theme

Social Studies: Presidents

### Materials

- Place-Value Charts (Teaching Aid C)
- Hundreds, Tens, Units (Punchouts or Math Kit)
- Common objects

### Introduction

**Using Concrete Materials** Use counters to extend the concept of renaming in subtraction to renaming with zeros. Have students demonstrate  $602 - 254$  [348] using the appropriate counters. Explain that they do not have enough units to take away 4 units. In order to do this, they will need to exchange counters twice. First they should exchange 1 hundred square for 10 ten-sticks. Then they can exchange 1 ten-stick for 10 units. Now the subtraction can be done.

### Using the Pages

**Teach** Ask students why the numbers in the example are rounded to the nearest ten to estimate. [Rounding to the nearest hundred or thousand would result in both numbers rounding to 1,900 or 2,000.]

Discuss the fact that comparing the exact answer to the estimate can establish the reasonableness of the exact answer.

Write the example on the board in a place-value box and subtract. Explain that when there are no ones and no tens, it is necessary to rename 1 hundred to get 10 tens and then to rename 1 ten as 10 ones.

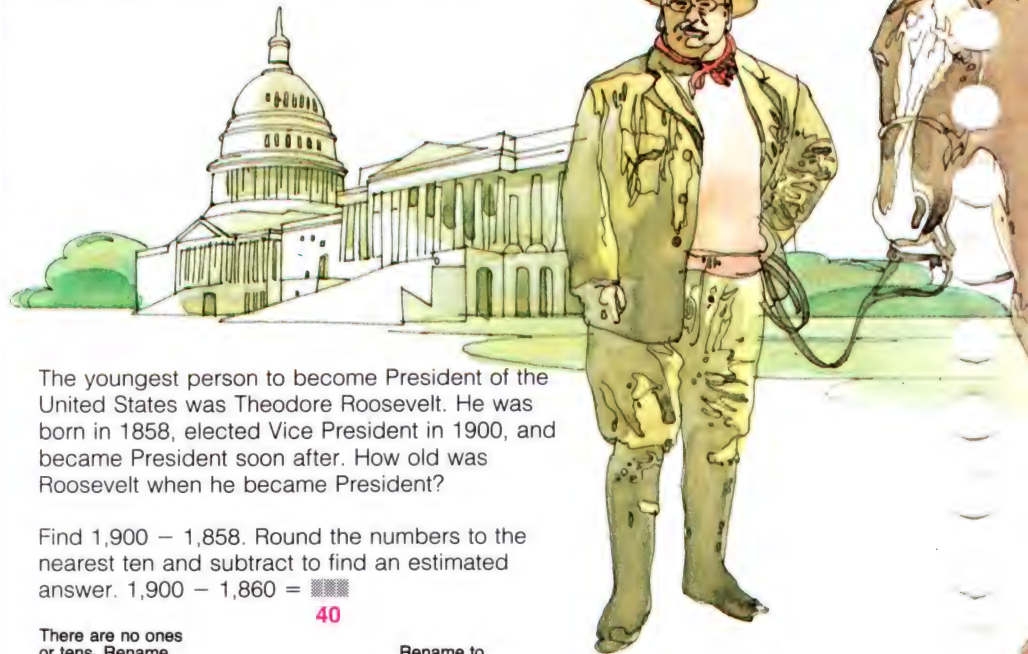
**Try Error Analysis** In Exercises c and e, watch for students who have difficulty when the number of digits in each number is not the same. Remind these students to use the number with fewer digits to determine to which place to round.

**Apply Problem Solving** Allow students to work in small groups to discuss and solve each question.

**Use data from another problem** Tell students that Thomas Jefferson died at age 83. Have them use the answer for Problem 26 to tell in what year he died. [1826]

(Continued on page 73.)

## Subtraction: Renaming with Zeros



The youngest person to become President of the United States was Theodore Roosevelt. He was born in 1858, elected Vice President in 1900, and became President soon after. How old was Roosevelt when he became President?

Find  $1,900 - 1,858$ . Round the numbers to the nearest ten and subtract to find an estimated answer.  $1,900 - 1,860 = 40$

There are no ones or tens. Rename to show 10 tens.

$$\begin{array}{r} 8 \text{ } 10 \\ 1900 \\ - 1858 \\ \hline \end{array}$$

9 hundreds = 8 hundreds 10 tens

Rename to show 10 ones.

$$\begin{array}{r} 9 \text{ } 8 \text{ } 10 \text{ } 10 \\ 1900 \\ - 1858 \\ \hline \end{array}$$

10 tens = 9 tens 10 ones

Subtract.

$$\begin{array}{r} 9 \text{ } 8 \text{ } 10 \text{ } 10 \\ 1900 \\ - 1858 \\ \hline 42 \end{array}$$

Theodore Roosevelt was 42 years old when he became President. Compare the estimated answer with the actual answer.

Was the actual answer close to the estimated answer? **Yes**  
What does this tell you? **The actual answer is reasonable.**

**Try** Estimate the answer to each of the exercises. Then find the actual answer and compare it to its estimated answer to check for reasonableness. **Estimated answers are in parentheses.**

a.  $\begin{array}{r} 807 \\ - 129 \\ \hline 678 \end{array}$  (700)

b.  $\begin{array}{r} 300 \\ - 167 \\ \hline 133 \end{array}$  (100)

c.  $\begin{array}{r} 8,004 \\ - 563 \\ \hline 7,441 \end{array}$  (7,400)

d.  $4,000 - 1,256$   
**2,744 (3,000)**

e.  $2,401 - 53$   
**2,348 (2,350)**

## Practice 29

Name \_\_\_\_\_

Subtract. Find each answer below. Write the letter for that exercise. You will learn an interesting fact.

1. $\begin{array}{r} 504 \\ - 137 \\ \hline \end{array}$ E	2. $\begin{array}{r} 200 \\ - 156 \\ \hline \end{array}$ 44 O	3. $\begin{array}{r} 304 \\ - 178 \\ \hline \end{array}$ 126 N	4. $\begin{array}{r} 603 \\ - 248 \\ \hline \end{array}$ 355 T
5. $\begin{array}{r} 708 \\ - 39 \\ \hline \end{array}$ 669 A	6. $\begin{array}{r} 500 \\ - 43 \\ \hline \end{array}$ 457 I	7. $\begin{array}{r} 401 \\ - 29 \\ \hline \end{array}$ 372 E	8. $\begin{array}{r} 700 \\ - 64 \\ \hline \end{array}$ 636 O
9. $\begin{array}{r} 3700 \\ - 3456 \\ \hline \end{array}$ 244 S	10. $\begin{array}{r} 5009 \\ - 2345 \\ \hline \end{array}$ 2664 R	11. $\begin{array}{r} 6802 \\ - 3747 \\ \hline \end{array}$ 3055 E	12. $\begin{array}{r} 3008 \\ - 1675 \\ \hline \end{array}$ 1333 H
13. $\begin{array}{r} 7046 \\ - 2392 \\ \hline \end{array}$ 4654 E	14. $\begin{array}{r} 4208 \\ - 387 \\ \hline \end{array}$ 3821 H	15. $\begin{array}{r} 2045 \\ - 783 \\ \hline \end{array}$ 1262 T	16. $\begin{array}{r} 2400 \\ - 1680 \\ \hline \end{array}$ 720 T
17. $\begin{array}{r} 5007 \\ - 879 \\ \hline \end{array}$ 4128 G	18. $\begin{array}{r} 4020 \\ - 528 \\ \hline \end{array}$ 3492 G	19. $\begin{array}{r} 2000 \\ - 1951 \\ \hline \end{array}$ 49 W	20. $\begin{array}{r} 3101 \\ - 499 \\ \hline \end{array}$ 2602 H

G E O R G E  
4,654 44 2,664 4,128 372

W A S H I N G T O N  
49 669 244 1,333 457 2,602 3,492 355 636 126

WOODEN  
720 3,055 367 1,262 3,821

## Reteaching 29

Name \_\_\_\_\_

Find  $400 - 125$ .

Work with a partner. Rename 1 hundred as 10 tens. Rename 1 ten as 10 ones. Subtract.

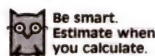
What President was a college football coach? Subtract. Place the letters of your answers in the blanks below.

1. $\begin{array}{r} 400 \\ - 259 \\ \hline \end{array}$ 141 H	2. $\begin{array}{r} 500 \\ - 381 \\ \hline \end{array}$ 119 I	3. $\begin{array}{r} 300 \\ - 163 \\ \hline \end{array}$ 137 W
4. $\begin{array}{r} 200 \\ - 174 \\ \hline \end{array}$ 26 O	5. $\begin{array}{r} 100 \\ - 58 \\ \hline \end{array}$ 42 E	6. $\begin{array}{r} 300 \\ - 42 \\ \hline \end{array}$ 258 D
7. $\begin{array}{r} 600 \\ - 71 \\ \hline \end{array}$ 529 N	8. $\begin{array}{r} 700 \\ - 29 \\ \hline \end{array}$ 671 T	9. $\begin{array}{r} 503 \\ - 24 \\ \hline \end{array}$ 479 W
10. $\begin{array}{r} 801 \\ - 67 \\ \hline \end{array}$ 734 R	11. $\begin{array}{r} 5600 \\ - 2355 \\ \hline \end{array}$ 3245 S	12. $\begin{array}{r} 1007 \\ - 983 \\ \hline \end{array}$ 24 G

D W I G H T  
258 479 119 24 141 671

E I S E N H O W E R  
42 119 3,245 42 529 141 26 137 42 734





### Practice Subtract.

- |   |   |   |
|---|---|---|
| 1. $\begin{array}{r} 605 \\ - 439 \\ \hline 166 \end{array}$        | 2. $\begin{array}{r} 403 \\ - 174 \\ \hline 229 \end{array}$        | 3. $\begin{array}{r} 500 \\ - 286 \\ \hline 214 \end{array}$        |
| 4. $\begin{array}{r} 700 \\ - 351 \\ \hline 349 \end{array}$        | 5. $\begin{array}{r} 204 \\ - 117 \\ \hline 87 \end{array}$         | 6. $\begin{array}{r} 800 \\ - 529 \\ \hline 271 \end{array}$        |
| 7. $\begin{array}{r} 504 \\ - 67 \\ \hline 437 \end{array}$         | 8. $\begin{array}{r} 706 \\ - 38 \\ \hline 668 \end{array}$         | 9. $\begin{array}{r} 300 \\ - 99 \\ \hline 201 \end{array}$         |
| 10. $\begin{array}{r} 800 \\ - 76 \\ \hline 724 \end{array}$        | 11. $\begin{array}{r} 408 \\ - 29 \\ \hline 379 \end{array}$        | 12. $\begin{array}{r} 503 \\ - 56 \\ \hline 447 \end{array}$        |
| 13. $\begin{array}{r} 6,902 \\ - 3,425 \\ \hline 3,477 \end{array}$ | 14. $\begin{array}{r} 5,801 \\ - 3,682 \\ \hline 2,119 \end{array}$ | 15. $\begin{array}{r} 2,600 \\ - 1,344 \\ \hline 1,256 \end{array}$ |
| 16. $6,700 - 5,379$<br>$\begin{array}{r} 1,321 \end{array}$         | 17. $2,030 - 269$<br>$\begin{array}{r} 1,761 \end{array}$           |   |
| 18. $7,020 - 443$<br>$\begin{array}{r} 6,577 \end{array}$           | 19. $2,004 - 372$<br>$\begin{array}{r} 1,632 \end{array}$           |   |
| 20. $5,002 - 661$<br>$\begin{array}{r} 4,341 \end{array}$           | 21. $3,076 - 83$<br>$\begin{array}{r} 2,993 \end{array}$            |   |
| 22. $1,027 - 45$<br>$\begin{array}{r} 982 \end{array}$              | 23. $6,000 - 1,278$<br>$\begin{array}{r} 4,722 \end{array}$         |   |

**Apply** Solve each problem.

24. John F. Kennedy was another young President. He was born in 1917 and elected President in 1960. How old was he when he was elected President?  
**43 years old**
25. The oldest person to be elected President was Ronald Reagan. He was born in 1911 and elected in 1980. How old was he when he was elected President?  
**69 years old**
26. Thomas Jefferson was elected President in 1800 at the age of 57. What was the year of his birth?  
**1743**
27. Abraham Lincoln was born in 1809 and elected President at the age of 51. In what year was he elected President?  
**1860**
28. **CALCULATOR** Press: 75  $\square$  30  $\square$  CE 40  $\square$  CE 25  $\square$  =.  
What happened on your calculator?  
**Subtracted 25 from 75.**

More Practice Set 29, page 362 **73**

## Assignment Guide

basic 1–15, 16–25 odd, 28  
average 1–19, 24–28  
enriched 1–9, 10–28

**More Practice Set 29,**  
**page 362**

(Continued from page 72.)

**Write a number sentence** Have students write a number sentence that will tell how old they are.

**Calculator** In Problem 28, explain to students that CE stands for *clear entry* and it can be thought of as an “eraser” key. It allows students to change a number if they have incorrectly pushed a wrong button without having to key in the entire problem again.

## Follow-Up

**Reteaching** Here is an alternate approach that some students may find easier. When subtracting from numbers that end with one or more zeros, students could reduce both numbers by one and then subtract.

$$\begin{array}{r} 5,700 \longrightarrow 5,699 \\ - 2,493 \longrightarrow - 2,492 \\ \hline [3,207] \end{array}$$

**Enrichment** Have students find the missing digits for these exercises.

$$\begin{array}{r} 4 \square 06[4] \quad 8 \square 4 \square [0,0] \quad 9 \square \square 8[4,4] \\ - 1892 \quad - 21 \square 7[3] \quad - 356 \square [2] \\ \hline 25 \square 4[1] \quad \square 903[5] \quad \square 886[5] \end{array}$$

## Enrichment 29

Name \_\_\_\_\_ E29

**More Subtraction Puzzles**

Complete each row by subtracting pairs of numbers in the row above it. Repeat the first number in each row at the end of the row.

1.

400	273	614	329	400
	341	285	71	
	214	56	214	56
	158	158	158	158
	0	0	0	0

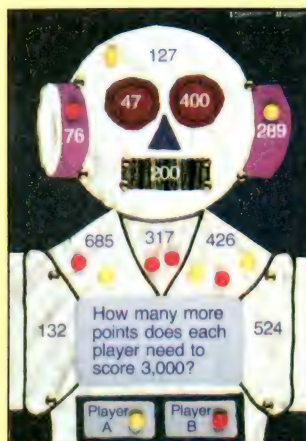
2.

2,178	3,946	5,000	4,639	2,178
	1,788	1,054	361	2,461
	714	693	2,100	693
	21	1,407	1,407	21
	1,386	0	1,386	0
	1,386	1,386	1,386	1,386
	0	0	0	0

3. What do you notice about the last row?  
**All the numbers are zero.**

4. Make your own subtraction puzzle using 4 different 3-digit numbers. You may need to add more rows to complete your puzzle.  
**Answers will vary.**

## Additional Resource 29



**Math Poster I Subtraction: Renaming with Zeros** Player A needs 1,047 points and player B needs 1,179 points to score 3,000. See Answer Key for extensions.

## Daily Maintenance

**Estimation** Choose the most sensible answer.

- How many years old is Mike's father? 4 40 400 [40]
- How much money did Mike spend to buy a small stuffed bear? \$5.00 \$150.00 \$1,500.00 [\$5.00]
- How many people are in Mike's family? 6 600 6,000 [6]



## Using Problem-Solving Strategies

- Use physical models.

### Materials

- Colored chips or other counters

### Introduction

Students work with concrete materials to simulate a situation and to solve problems.

### Using the Pages

Before students begin their group work, refer them to pages 438–441 for a discussion. See the corresponding section on pages 470–473 in this Teacher's Edition.

After students have used physical models to complete the experiment once, have each group report how many socks were drawn before two of the same color were found. For Problem 2, the least number that could have been drawn is 2, and the greatest number is 4.

For Problem 3, encourage students to have reasons for their decisions other than those based on the experiment. Questions which might be asked if students are having difficulties are:

1. Would Claudia be sure of having a matching pair if she took 2 socks? Why or why not? [No. She could get 2 different colors.]

2. How many different colors of socks might Claudia get if she took 3 socks? [3 colors]

3. Would Claudia be sure of having a matching pair if she took 3 socks? [No] The least number of socks that Claudia should take is 4. If she takes 3 socks, each one might be a different color. The fourth sock would have to match one of the first three.

For Problem 4, if Claudia has 4 different color of socks, she will need to take 5 socks. If she takes 4 socks, each one might be a different color. The fifth sock would have to match one of the first four. Similarly, if Claudia has 6 different colors of socks, she will need to take 7 socks.

Problem 6 requires students to match 3 colors. Have students use their models to find the least number of stickers she should take. [9 stickers] If she took 8 stickers, she might have 2 of each color. The ninth sticker will be the third sticker of one of the colors. You may want to ask some of the following questions if students are having difficulties with this problem.

1. If Claudia took 3 stickers, would she be sure of having 3 of the same color? [No]

(Continued on page 75.)

## Using Problem-Solving Strategies

# THE SOCK DRAW

Claudia was getting dressed for a party when a storm caused the lights to go out. She still needed to find a matching pair of socks. She knew that she had only 3 colors of socks in the drawer—white, yellow, and blue. Her brother said, "Just take several, and then when we get in the car you can pick out a matching pair." *What is the least number of socks that she should take to be sure of having a matched pair?*



Work in groups of 4. In this book you will often be asked to work in groups. Turn to pages 438–441 for instructions on group work.

We could act out this problem by using different colored counters to represent the socks. Place 6 counters, 2 of each color, in an envelope or some other container and draw out some "socks" one at a time until two of the same color are drawn.

1. How many socks did your group draw before two of one color were drawn? **Answers will vary.**  
**Possible answers: 2 socks, 3 socks, 4 socks**
2. Compare the results of your group with those of other groups. What was the least number of draws found by a group in your class? What was the greatest number of draws?  
**2 socks; 4 socks**



## COMPUTER

### BASIC: Addition and Subtraction in PRINT Statements

Repeat the experiment two more times. Compare your results with those of other groups.

3. How many socks do you think Claudia should take? Give reasons for your decision.

**See Using the Pages.**



4. Suppose that Claudia had 4 different colors of socks. How many socks should she take to make sure that she would have a matching pair?

**5 socks**

5. If Claudia had socks of 6 different colors, how many socks should she take?

**7 socks**

6. Claudia is taking a present to the party. She has almost finished wrapping it. She wants to decorate the package with 3 stickers of the same color. She has stickers of 4 different colors in a bag. What is the least number of stickers that she should take so that she will be sure to have 3 stickers of one color?

**9 stickers**

When this program is run on a computer, the numbers are added and only the answer is printed.

```
10 PRINT 243+119
20 END
```

This is printed.

362

For this program, the numbers are subtracted and the answer is printed.

```
10 PRINT 845-286
20 PRINT 756-397
30 END
```

This is printed.

559  
359

Tell what would be printed for each program.

1. 10 PRINT 325+295 **620**  
20 END
2. 10 PRINT 756-397 **359**  
20 END
3. 10 PRINT 196+242 **438**  
20 PRINT 5124+1683 **6807**  
30 END
4. 10 PRINT 289-191 **98**  
20 PRINT 2763-1825 **938**  
30 PRINT 563+108 **671**  
40 END
- \*5. 10 PRINT "THE SUM IS"  
30 PRINT "THE DIFFERENCE IS"  
40 PRINT 503-75  
20 PRINT 67+98+35  
50 END

**See margin.**

75

## Assignment Guide

basic	1-6
average	1-6
enriched	1-6

(Continued from page 74.)

2. If Claudia took 4 stickers, would she be sure of having 3 of the same color? [No]
3. How many different colors might she have if she took 8 stickers? [Two stickers of each color]
4. If she took 8 stickers, would she be sure of having 3 of the same color? [No]

### Computer

When using the computer to do these exercises, tell students to type the command NEW between programs to clear the computer's memory.

Students may make typing errors which will result in either a syntax error, or the incorrect answer. The command LIST can be typed to see a display of the program currently in the memory. This will be helpful in finding errors. The computer only does what it is told to do and students who type in the wrong words or numbers will not get the desired results.

### Follow-Up

Have students look back at the three different sock problem. Without showing any work, ask students to give the least number of socks that Claudia would need to take if she had 10 colors of socks. [11 socks] Then have students give a rule for telling the least number of socks needed for any number of colors. [The least number of socks needed is one more than the number of colors.]

### Calculator

What number can you subtract from 1000 to get

- |               |               |
|---------------|---------------|
| 1. 222? [778] | 2. 333? [667] |
| 3. 444? [556] | 4. 555? [445] |
| 5. 666? [334] | 6. 777? [223] |
| 7. 888? [112] | 8. 999? [1]   |

### Daily Maintenance

**Mental Math** Have students tell if the sum will be more or less than 100. Then have them give the sum.

1.  $68 + 87$  [greater, 155]
2.  $36 + 29$  [less, 65]
3.  $92 + 75$  [greater, 167]
4.  $53 + 41$  [less, 94]

### Computer Answers, page 75

5. THE SUM IS  
200
- THE DIFFERENCE IS  
428



## Objective 30

Add or subtract numbers with up to four digits and check the answers.

### Lesson Theme

School Activities: Library Work

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Write the following exercises on the board.

$$\begin{array}{r} 12 \\ - 7 \\ \hline 5 \end{array} \quad \begin{array}{r} 7 \\ + 5 \\ \hline 12 \end{array}$$

Have students demonstrate these exercises with counters or similar objects. Discuss the ways in which these exercises are similar. [They use the same numbers in both exercises. They belong to the same family of facts.] Then review the idea of families of facts developed on pages 12–13. Point out how addition can be used to check subtraction and how subtraction can be used to check addition.

**Motivational Situation** Pose the following problem to the students. What types of things can you find in a library besides books? [Records, magazines, pictures, films, tapes, furniture, computers] Suppose you were a librarian. What kinds of information would you need to know? [How many people use the library each day? How many books are withdrawn daily? Which magazines are most popular?]

## Using the Pages

**Teach** Read and discuss the examples. In Example B, point out that Isabel also could check by subtracting 476 from 601. [ $601 - 476 = 125$ ]

**Practice Error Analysis** In Exercises 11–20, watch for students who confuse the signs. To help them remember that the signs change, suggest that they circle the plus sign in each addition exercise. You might also suggest that they do all the addition exercises first and then the subtraction exercises. (See Reteaching 30.)

**Apply Problem Solving** Discussion with individual students about his or her attitude toward math may point up where help is needed.

## Checking Addition and Subtraction

Isabel Diaz works in the school library. Whenever she uses addition or subtraction in her work, she checks her answers.

- A. Isabel uses addition to check subtraction.

Check:

$$\begin{array}{r} 654 \\ - 279 \\ \hline 375 \end{array} \quad \begin{array}{r} 375 \\ + 279 \\ \hline 654 \end{array}$$

- B. Isabel uses subtraction to check addition.

Check:

$$\begin{array}{r} 476 \\ + 125 \\ \hline 601 \end{array} \quad \begin{array}{r} 601 \\ - 125 \\ \hline 476 \end{array}$$

**Discuss** How can you use addition to check addition?

**Add in a different order**



## Practice 30

Check each answer. If it is wrong, give the correct answer. If the answer is correct, shade the box. Write the letters in the shaded boxes in order on the blanks below. The letters will spell the name of a city in Pennsylvania.

P30

1. $\begin{array}{r} 254 \\ 84 \\ \hline 170 \end{array}$ P	2. $\begin{array}{r} 4054 \\ - 1161 \\ \hline 5215 \end{array}$ I	3. $\begin{array}{r} 707 \\ - 403 \\ \hline 304 \end{array}$ T	4. $\begin{array}{r} 6241 \\ - 1897 \\ \hline 8138 \end{array}$ H
5. $\begin{array}{r} 828 \\ - 187 \\ \hline 1015 \end{array}$ I	6. $\begin{array}{r} 187 \\ - 409 \\ \hline 606 \end{array}$ 596 T	7. $\begin{array}{r} 584 \\ - 198 \\ \hline 386 \end{array}$ L	8. $\begin{array}{r} 408 \\ - 297 \\ \hline 211 \end{array}$ S
9. $\begin{array}{r} 4567 \\ - 909 \\ \hline 3658 \end{array}$ A	10. $\begin{array}{r} 8281 \\ - 1065 \\ \hline 9246 \end{array}$ S	11. $\begin{array}{r} 71 \\ - 89 \\ \hline 160 \end{array}$ D	12. $\begin{array}{r} 600 \\ - 185 \\ \hline 425 \end{array}$ E
13. $\begin{array}{r} 381 \\ - 145 \\ \hline 244 \end{array}$ C	14. $\begin{array}{r} 4328 \\ - 5009 \\ \hline 9337 \end{array}$ E	15. $\begin{array}{r} 455 \\ - 555 \\ \hline 1010 \end{array}$ L	16. $\begin{array}{r} 813 \\ - 24 \\ \hline 789 \end{array}$ P
17. $\begin{array}{r} 5438 \\ + 222 \\ \hline 5660 \end{array}$ H	18. $\begin{array}{r} 100 \\ - 69 \\ \hline 31 \end{array}$ I	19. $\begin{array}{r} 1040 \\ - 885 \\ \hline 255 \end{array}$ S	20. $\begin{array}{r} 347 \\ + 743 \\ \hline 1090 \end{array}$ E
21. $\begin{array}{r} 451 \\ - 109 \\ \hline 342 \end{array}$ M	22. $\begin{array}{r} 3841 \\ - 1008 \\ \hline 1833 \end{array}$ N	23. $\begin{array}{r} 5381 \\ - 2909 \\ \hline 2472 \end{array}$ A	24. $\begin{array}{r} 345 \\ - 198 \\ \hline 533 \end{array}$ N

P H I L A D E L P H I A

## Reteaching 30

Check each answer.

To check addition, I can subtract.

To check subtraction, I can add.

Add or subtract. Check each answer.

1. $\begin{array}{r} 478 \\ + 219 \\ \hline 697 \end{array}$ 697	2. $\begin{array}{r} 508 \\ - 126 \\ \hline 382 \end{array}$ 382
3. $\begin{array}{r} 82 \\ - 17 \\ \hline 65 \end{array}$ 65	4. $\begin{array}{r} 394 \\ + 238 \\ \hline 632 \end{array}$ 632
5. $\begin{array}{r} 129 \\ + 261 \\ \hline 390 \end{array}$ 390	6. $\begin{array}{r} 600 \\ - 344 \\ \hline 256 \end{array}$ 256
7. $\begin{array}{r} 8002 \\ + 1205 \\ \hline 9207 \end{array}$ 9207	8. $\begin{array}{r} 3471 \\ - 2648 \\ \hline 823 \end{array}$ 823



**Try** Check each answer. Tell whether it is right or wrong. If it is wrong, give the correct answer.

- |   |   |  |  |  |
|---|---|--|--|--|
| a. $\begin{array}{r} 478 \\ + 972 \\ \hline 1,440 \end{array}$<br><b>Wrong; 1,450</b> | b. $\begin{array}{r} 837 \\ - 84 \\ \hline 753 \end{array}$<br><b>Right</b> | c. $\begin{array}{r} 6,300 \\ - 2,164 \\ \hline 4,136 \end{array}$<br><b>Right</b> | d. $\begin{array}{r} 276 \\ - 88 \\ \hline 192 \end{array}$<br><b>Wrong; 188</b> | e. $\begin{array}{r} 4,506 \\ + 1,293 \\ \hline 5,799 \end{array}$<br><b>Right</b> |
|---|---|--|--|--|

**Practice** Check each answer. Tell whether it is right or wrong. If it is wrong, give the correct answer.

- |   |  |   |   |  |
|---|--|---|---|--|
| 1. $\begin{array}{r} 61 \\ + 59 \\ \hline 110 \end{array}$<br><b>Wrong; 120</b> | 2. $\begin{array}{r} 346 \\ + 183 \\ \hline 529 \end{array}$<br><b>Right</b>     | 3. $\begin{array}{r} 526 \\ + 295 \\ \hline 721 \end{array}$<br><b>Wrong; 821</b> | 4. $\begin{array}{r} 3,728 \\ + 4,963 \\ \hline 8,591 \end{array}$<br><b>Wrong; 8,691</b> | 5. $\begin{array}{r} 8,833 \\ + 1,079 \\ \hline 9,912 \end{array}$<br><b>Right</b>     |
| 6. $\begin{array}{r} 81 \\ - 68 \\ \hline 13 \end{array}$<br><b>Right</b>       | 7. $\begin{array}{r} 623 \\ - 89 \\ \hline 634 \end{array}$<br><b>Wrong; 534</b> | 8. $\begin{array}{r} 365 \\ - 174 \\ \hline 191 \end{array}$<br><b>Right</b>      | 9. $\begin{array}{r} 9,516 \\ - 1,624 \\ \hline 8,112 \end{array}$<br><b>Wrong; 7,892</b> | 10. $\begin{array}{r} 2,009 \\ - 1,378 \\ \hline 731 \end{array}$<br><b>Wrong; 631</b> |

Add or subtract. Watch the signs. Check each answer.

- |   |   |   |   |   |
|---|---|---|---|---|
| 11. $\begin{array}{r} 289 \\ - 191 \\ \hline 98 \end{array}$      | 12. $\begin{array}{r} 756 \\ - 397 \\ \hline 359 \end{array}$       | 13. $\begin{array}{r} 196 \\ + 242 \\ \hline 438 \end{array}$     | 14. $\begin{array}{r} 503 \\ - 75 \\ \hline 428 \end{array}$        | 15. $\begin{array}{r} 682 \\ + 357 \\ \hline 1,039 \end{array}$     |
| 16. $\begin{array}{r} 5,124 \\ + 638 \\ \hline 5,762 \end{array}$ | 17. $\begin{array}{r} 3,298 \\ + 2,043 \\ \hline 5,341 \end{array}$ | 18. $\begin{array}{r} 7,048 \\ - 563 \\ \hline 6,485 \end{array}$ | 19. $\begin{array}{r} 5,006 \\ - 2,317 \\ \hline 2,689 \end{array}$ | 20. $\begin{array}{r} 7,324 \\ + 1,676 \\ \hline 9,000 \end{array}$ |

**Apply** Solve each problem. Check your answers.

21. The school library has 3,050 books. 598 of them are now checked out. How many books are left in the library?  
**2,452 books**
22. The library has 1,478 fiction books and 1,756 nonfiction books. How many fiction and nonfiction books does the library have?  
**3,234 books**
23. In January, 805 library books were checked out. In February, 769 library books were checked out. How many more library books were checked out in January than in February?  
**36 books**
24. **Calculator** A library system has bookmobiles containing 5,645 books, 4,780 books, and 6,930 books. The main library building contains 17,250 books. How many books in all are in this library system?  
**34,605 books**

More Practice Set 30, page 362 **77**

## Assignment Guide

basic 1–15, 21, 23–24  
average 1–10 even, 11–21, 23–24  
enriched 1–10 odd, 11–24

**More Practice Set 30, page 362**

**Homework to do with others** With the help of another person, have each student estimate how many fiction books and nonfiction books are in the local library. Ask each student to use this information to make up and solve a problem. Tell each student to be sure to discuss the problem, the solution, and the strategies used, with the other person. Have each student bring a copy of his or her problem to class.

## Follow-Up

**Extra Practice** Write an addition or subtraction exercise on the board similar to those in the lesson. Then write either a correct or incorrect answer. Have students raise their hands if the answer is correct. If it is not, have one student correct it at the board and tell why it was not correct.

You may also wish to adapt the games on pages 326–327 for use with this lesson.

**Enrichment Write a problem** Have students make up their own addition and subtraction word problems and answer them. Then have students change some of the answers to make them wrong. Students then exchange problems with classmates, check the problems, and correct the wrong answers.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Addition and Subtraction 3, Activity 8

## Enrichment 30

Name: \_\_\_\_\_ E30

**Letter Addition**

Each letter stands for one of the digits 0–9. Find the digit for each letter. Each letter keeps the same value for all exercises.

1.  $\begin{array}{r} AA \\ + AA \\ \hline 132 \end{array}$  A = 6

2.  $\begin{array}{r} BBB \\ + BAA \\ \hline 888 \end{array}$  B = 2

3.  $\begin{array}{r} ACA \\ + BC \\ \hline 785 \end{array}$  C = 9

4.  $\begin{array}{r} DC \\ + CD \\ \hline 108 \end{array}$  D = 3

5.  $\begin{array}{r} BEC \\ + CC \\ \hline 078 \end{array}$  E = 7

6.  $\begin{array}{r} FBC \\ + EBE \\ \hline 1884 \end{array}$  F = 5

7.  $\begin{array}{r} AGA \\ + CFF \\ \hline GFEG \end{array}$  G = 1

8.  $\begin{array}{r} HFE \\ + GBF \\ \hline CHB \end{array}$  H = 8

9.  $\begin{array}{r} HEAC \\ + BDG \\ \hline CJJJ \end{array}$  J = 0

10.  $\begin{array}{r} KKAH \\ + KJED \\ \hline HFKG \end{array}$  K = 4

A sore back?

## Additional Resource 30

Name: \_\_\_\_\_ Additional Resource 30

**Calculator Find the Operations**

Write + or – in each box to make the sentence true.

Example:  $12 \square 2 \square 10$  Subtraction is the operation since 2 subtracted from 12 is 10.

1.  $23 \square 13 \square 36$  2.  $23 \square 13 \square 10$  3.  $47 \square 19 \square 66$

4.  $47 \square 19 \square 28$  5.  $36 \square 17 \square 53$  6.  $36 \square 17 \square 19$

7.  $16 \square 23 \square 39$  8.  $75 \square 18 \square 57$  9.  $83 \square 28 \square 55$

10.  $57 \square 13 \square 30 \square 40$  11.  $12 \square 9 \square 74 \square 77$

12.  $21 \square 9 \square 67 \square 79$  13.  $44 \square 11 \square 17 \square 72$

14.  $13 \square 78 \square 21 \square 70$  15.  $86 \square 91 \square 34 \square 143$

16.  $35 \square 12 \square 9 \square 14$  17.  $35 \square 12 \square 9 \square 32$

18.  $35 \square 12 \square 9 \square 56$  19.  $35 \square 12 \square 9 \square 38$

20.  $65 \square 23 \square 12 \square 54$  21.  $65 \square 23 \square 12 \square 30$

Use me to check your answers for these exercises on addition and subtraction.

## Daily Maintenance

1.  $9 + 13 + 8$  [30]
2.  $16 + 54 + 72$  [142]
3.  $55 + 86 + 27$  [168]
4.  $368 + 291 + 402$  [1,061]
5.  $813 + 562 + 780$  [2,155]



## Objective 31

Add or subtract amounts of money.

### Lesson Theme

Computers: Uses of Computers

### Materials

- Money (Punchouts)
- Merchandise catalogs

## Introduction

**Using Concrete Materials** Write \$2.68 and \$1.73 on the chalkboard. Have students count out both amounts using play money. Then have them add the amounts. Tell them to combine the pennies, exchanging 10 pennies for 1 dime. Then tell them to combine the dimes, exchanging 10 dimes for 1 dollar. Write the computation on the chalkboard.

## Using the Pages

**Teach** The code bars pictured identify two pieces of information. The code bars on the left, represented by the number 36000, represent the general type of food, such as soup. The code bars on the right represent the specific variety of that food. The number 290 might represent chicken noodle and the number 295 might represent vegetable beef. Use play money, if needed, when doing the examples.

**Calculator** For Example C, remind students to enter the decimal points into the calculator. Watch for students who incorrectly interpret the answer display as \$10.04, or \$1.04. Point out that when using a calculator to add or subtract money, a single digit may appear to the right of the decimal point in the answer display. Explain that zero must be placed to the right of this digit in order to express their answer in terms of dollars and cents. Remind students that a dollar sign must be written in front of the number. Ask students how they would know if their calculator answer is reasonable. [Estimate before calculating.]

**Try** Remind students to put the decimal point and dollar sign in their answers.

**Practice Estimation** Suggest to students that when they estimate with money, they may want to round all amounts up. Discuss when this technique is appropriate [In shopping to be sure you have enough money] and when it might not be appropriate. [In estimating income from odd jobs or babysitting]

(Continued on page 79.)

## Addition and Subtraction of Money

The "zebra stripes" on most supermarket products are bar codes. When read by a scanner, the codes identify the product to the store's computer. The computer contains price information that is then automatically rung on the cash register.



- A.** The computer scanner read codes for \$1.59 and \$3.27. What total was rung on the cash register?

$$\begin{array}{r} \$1.59 \\ + \$3.27 \\ \hline \$4.86 \end{array}$$

The total was \$4.86.

- B.** The cash register total for Kenji's order was \$2.89. He paid for it with a \$5.00 bill. How much money did Kenji get back?

$$\begin{array}{r} \$5.00 \\ - \$2.89 \\ \hline \$2.11 \end{array}$$

Kenji got back \$2.11.

- C. CALCULATOR** One day Jody did some grocery shopping for both her mother and her grandfather. Her mother's groceries cost \$18.38 and her grandfather's cost \$7.98. How much more did her mother's groceries cost than her grandfather's? Use a calculator to find  $\$18.38 - \$7.98$ .

Press: 18  $\square$  .  $\square$  38  $\square$  -  $\square$  7  $\square$  .  $\square$  98  $\square$  =

Display: 10.4  
\$10.40

78



## Practice 31

**THE QUARTER HAD MORE CENTS**

1. \$3.25 + 4.62 \$7.87	2. \$8.62 + 1.37 \$9.99	3. \$1.26 + 3.50 \$4.76	4. \$4.66 + 1.41 \$6.07
5. \$3.65 + 0.73 \$4.38	6. \$2.75 + 2.38 \$5.13	7. \$1.04 + 0.91 \$1.95	8. \$1.56 + 1.89 \$3.45
9. \$3.71 + 2.32 \$6.03	10. \$0.78 + 0.48 \$1.26	11. \$1.12 + 0.75 \$1.87	12. \$4.79 + 5.89 \$10.68
13. \$2.40 + 1.65 \$4.05	14. \$4.87 + 1.94 \$6.81	15. \$2.59 + 2.46 \$5.05	16. \$4.62 + 1.83 \$6.45
17. \$7.30 + 3.14 \$10.44	18. \$4.25 + 3.07 \$7.32	19. \$2.34 + 1.67 \$4.01	20. \$5.81 + 3.23 \$9.04

## Reteaching 31

**NAME: \_\_\_\_\_**

Add \$6.72 + \$2.41 = \$9.13

Subtract \$7.06 - \$3.59 = \$3.47

When do astronauts eat?

Add or subtract. Match each letter to its answer in the blanks below.

1. \$2.37 + 3.41 \$5.78	2. \$1.43 + 2.19 \$3.62	3. \$6.81 + 1.45 \$8.26	4. \$7.53 + 1.68 \$9.21
5. \$0.37 + 0.27 \$0.64	6. \$2.70 + 1.28 \$3.98	7. \$2.48 + 0.48 \$2.96	8. \$4.91 + 2.92 \$7.83
9. \$5.69 + 2.47 \$8.16	10. \$4.28 + 1.19 \$5.47	11. \$3.04 + 1.72 \$4.76	12. \$2.74 + 1.37 \$4.11

**A T L A U N C H**

\$3.22 \$5.78 \$39.91 \$8.26 \$1.32 \$78.46 \$3.09 \$13.66

**T I M E**

\$2.96 \$3.62 \$9.21 \$0.64



**Try** Add or subtract.

a. $\begin{array}{r} \$53.25 \\ + 7.85 \\ \hline \$61.10 \end{array}$	b. $\begin{array}{r} \$10.00 \\ - 6.24 \\ \hline \$3.76 \end{array}$	c. $\begin{array}{r} \$29.26 \\ - 4.94 \\ \hline \$24.32 \end{array}$
---	--	---

**Practice** Add or subtract.

1. $\begin{array}{r} \$8.54 \\ + 0.23 \\ \hline \$8.77 \end{array}$	2. $\begin{array}{r} \$5.42 \\ + 4.68 \\ \hline \$10.10 \end{array}$	3. $\begin{array}{r} \$43.49 \\ + 24.77 \\ \hline \$68.26 \end{array}$
4. $\begin{array}{r} \$16.32 \\ - 4.93 \\ \hline \$11.39 \end{array}$	5. $\begin{array}{r} \$89.35 \\ - 34.82 \\ \hline \$54.53 \end{array}$	6. $\begin{array}{r} \$73.91 \\ - 6.47 \\ \hline \$67.44 \end{array}$

**Choosing a Computation Method**

Calculator, Paper and Pencil, Mental Math

Choose a method to solve each problem.

Tell which method you used.

7. $\begin{array}{r} \$5.99 \\ + 0.17 \\ \hline \$6.16; M \end{array}$	8. $\begin{array}{r} \$79.18 \\ + 32.82 \\ \hline \$112.00; M, P, C \end{array}$	9. $\begin{array}{r} \$0.98 \\ + 0.49 \\ \hline \$1.47; M \end{array}$
10. $\begin{array}{r} \$5.25 \\ - 0.98 \\ \hline \$4.27; M, P \end{array}$	11. $\begin{array}{r} \$5.00 \\ - 2.62 \\ \hline \$2.38; P, C \end{array}$	12. $\begin{array}{r} \$86.45 \\ - 52.82 \\ \hline \$33.63; P, C \end{array}$

**Apply** Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Choose a method to solve each problem.

Tell which method you used. Explain to another student why you chose that method.

13. Judy has \$10.00. Can she buy nuts for \$5.65 and dried fruit for \$4.39?  
**No; E**

14. The cash register total for Ramona's order was \$6.45. She paid for it with a \$10.00 bill. How much money did she get back?  
**\$3.55; P, C**

15. Wayne bought grocery items costing \$1.73, \$2.45, \$3.27, \$0.89, \$1.19, \$0.66, and \$0.53. What was the total?  
**\$10.72; C**

16. Amy bought a roast for \$7.78 and fruit for \$3.85. To the nearest dollar, what was the total?  
**\$12.00; E**

More Practice Set 31, page 363 79

## Assignment Guide

basic 1-16  
average 1-16  
enriched 1-16

**More Practice Set 31,**  
**page 363**

(Continued from page 78.)

When amounts of money are written with a dollar sign, zero is written in the dollars place if there are no dollars.

**Choosing a computation method** Encourage students to try Exercises 7-10 mentally and then explain their strategies. For example, in Exercise 8, some students might notice that 18¢ plus 82¢ equals \$1; add it to \$79 to get \$80; \$80 plus \$32 equals \$112. See pages 444-445 in this Teacher's Edition for a discussion of mental math strategies.

**Apply** Problem Solving

**Choosing a computation method** For Problem 13, students estimate to determine whether there is enough money. For Problem 15, the calculator is the selected method because of the large quantity of numbers that must be added. Problem 16 does not ask students to find an exact answer.

## Follow-Up

**Extra Practice** Have students work in pairs. One names two amounts of money less than \$10 and the other finds the sum and difference. Then reverse the procedure. After students have worked at this activity for a little while, ask them what the greatest sum possible is. [\$19.98] Then ask what the least difference possible is. [\$0.00] Finally ask what the greatest possible sum would be if each of the two amounts were less than \$20.00. [\$39.98]

**Reteaching** Using Concrete Materials

Use play money to do the *Try* and *Apply* exercises.

**Enrichment** Use data from outside

**the text** Have students bring merchandise catalogs to school, and pretend they have \$25 to spend on items from the catalog. Have them choose items and add the prices to find the total amount (not to exceed \$25). Then have them subtract from \$25 the amount they supposedly spent to calculate how much money they would have left.

## Daily Maintenance

- 867 - 582 [285]
- 742 - 336 [406]
- 975 - 691 [284]
- 5,861 - 634 [5,227]
- 2,738 - 595 [2,143]

## Enrichment 31

Name: \_\_\_\_\_ E31

**How Much Change Do I Get?**

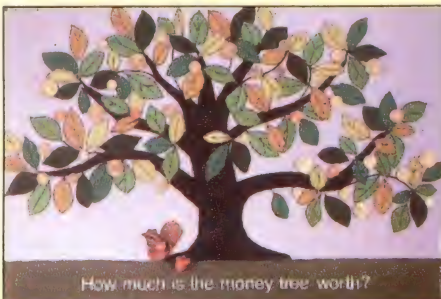
Mrs. Lyons is a cashier at a hardware store. The cash register is broken, so she must add to find the total amount of each purchase and then subtract to make change for the customer.

Find the change for each customer.

Hammer \$12.98	Paintbrush \$2.59	Tape measure \$4.89
Toolbox \$15.95	Drill \$19.59	Wrench \$14.98

- Hammer \$12.98      Wrench \$14.98      Toolbox \$15.95  
 Paintbrush \$2.59      Drill \$19.59      Hammer \$12.98  
 Total Cost \$15.57      Total Cost \$34.57      Total Cost \$28.93  
 Amount given to cashier: \$20      Amount given to cashier: \$40      Amount given to cashier: \$30  
 Change \$4.43      Change \$5.43      Change \$1.07
- Tape Measure \$4.89      Tape Measure \$4.89      Toolbox \$15.95  
 Wrench \$14.98      Paintbrush \$2.59      Drill \$19.59  
 Hammer \$12.98      Hammer \$12.98      Wrench \$14.98  
 Total Cost \$32.85      Total Cost \$20.46      Total Cost \$50.52  
 Amount given to cashier: \$35      Amount given to cashier: \$25      Amount given to cashier: \$55  
 Change \$2.15      Change \$4.54      Change \$4.48

## Additional Resource 31



### Math Poster J Addition of Money

The money tree is worth \$8.09. Ask students how much more money would be needed to make the tree worth \$10.00 [\$1.91] or \$15.00 [\$6.91]. Ask how much the tree would be worth without the seven coins on the limb at bottom left. [\$6.83] See Answer Key for other extensions of this poster.



## Practice

Mixed Practice for Objectives 20–31

### Materials

- Play money: \$100, \$10, and \$1

## Introduction

**Warm-Up Review** Review addition with renaming, using  $2,387 + 5,846$ . [8,233] Review subtraction with renaming, using  $5,295 - 3,286$  [2,009] and  $8,005 - 6,234$ . [1,771] Have students check all answers.

## Using the Pages

**Practice** Caution students to watch the signs carefully in Exercises 29–63.

**Estimation** Have students estimate the answers to Exercises 1–5 and 15–19 before they compute.

**Mental Math** For additional practice of mental arithmetic skills, give students the following exercises.  $400 + 300$  [700],  $6,000 - 2,000$  [4,000],  $375 + 201$  [576],  $824 - 320$  [504]

**Apply Problem Solving** Encourage students by telling them that making and correcting mistakes is part of problem solving. Sometimes several methods must be attempted before a problem is solved.

**Use physical models** Have students demonstrate Problems 65, 67, and 68 using play money.

**Use estimation** It is not always important to know an exact number. Ask students why an exact number is not needed in Problem 69 and for what this type of information could be used. [Determining expected sales, how much to order]

**Calculator** Students may use two methods to solve Problem 68. They can add the prices of all the other groceries and subtract that sum from the total price. Students utilize the calculator memory for this method by entering the total price into the memory (**M+**), and then after adding the prices of the other groceries, subtract this sum from the memory (**M-**). The final amount can be obtained by pressing the memory recall key (**RCM**). Students can also subtract the price of the first item from the total price, then subtract the price of the second item from that amount, and so on until the price of each item has been subtracted. The final amount will be the cost of the bread. You might want to ask students to write their key sequences.

## Practice: Addition and Subtraction

**Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math

For Exercises 1–43, choose a method to find each answer.

Tell which method you used. Add.

- |  |  |  |  |   |
|--|--|--|--|---|
| 1. $\begin{array}{r} 38 \\ + 45 \\ \hline \end{array}$<br>83; P              | 2. $\begin{array}{r} 262 \\ + 178 \\ \hline \end{array}$<br>440; P           | 3. $\begin{array}{r} 582 \\ + 255 \\ \hline \end{array}$<br>837; P         | 4. $\begin{array}{r} 4,238 \\ + 3,922 \\ \hline \end{array}$<br>8,160; P, C    | 5. $\begin{array}{r} 9,881 \\ + 4,073 \\ \hline \end{array}$<br>13,954; P, C        |
| 6. $\begin{array}{r} 874 \\ + 67 \\ \hline \end{array}$<br>941; P            | 7. $\begin{array}{r} 2,362 \\ + 574 \\ \hline \end{array}$<br>2,936; P, C    | 8. $\begin{array}{r} 71 \\ 67 \\ + 24 \\ \hline \end{array}$<br>162; P     | 9. $\begin{array}{r} 526 \\ 812 \\ + 114 \\ \hline \end{array}$<br>1,452; P, C | 10. $\begin{array}{r} 4,861 \\ 3,674 \\ + 2,233 \\ \hline \end{array}$<br>10,768; C |
| 11. $954 + 76$<br>1,030; P, C  | 12. $581 + 295$<br>876; P, C   | 13. $4,860 + 853$<br>5,713; P, C   | 14. $2,535 + 485$<br>3,020; P, C   |   |
| Subtract.  |  |  |  |   |
| 15. $\begin{array}{r} 64 \\ - 26 \\ \hline \end{array}$<br>38; P             | 16. $\begin{array}{r} 548 \\ - 59 \\ \hline \end{array}$<br>489; P           | 17. $\begin{array}{r} 453 \\ - 124 \\ \hline \end{array}$<br>329; P, C     | 18. $\begin{array}{r} 384 \\ - 177 \\ \hline \end{array}$<br>207; P, C         | 19. $\begin{array}{r} 6,007 \\ - 4,253 \\ \hline \end{array}$<br>1,754; P, C        |
| 20. $\begin{array}{r} 8,143 \\ - 1,287 \\ \hline \end{array}$<br>6,856; P, C | 21. $\begin{array}{r} 6,780 \\ - 4,273 \\ \hline \end{array}$<br>2,507; P, C | 22. $\begin{array}{r} 8,003 \\ - 547 \\ \hline \end{array}$<br>7,456; P, C | 23. $\begin{array}{r} 4,259 \\ - 172 \\ \hline \end{array}$<br>4,087; P, C     | 24. $\begin{array}{r} 4,600 \\ - 1,439 \\ \hline \end{array}$<br>3,161; P, C        |
| 25. $665 - 88$<br>577; P, C  | 26. $4,516 - 925$<br>3,591; P, C   | 27. $8,346 - 153$<br>8,193; P, C   | 28. $8,500 - 723$<br>7,777; P, C   |   |
| Add or subtract. Watch the signs. Check each answer.                         |  |  |  |   |
| 29. $\begin{array}{r} 643 \\ - 292 \\ \hline \end{array}$<br>351             | 30. $\begin{array}{r} 234 \\ + 681 \\ \hline \end{array}$<br>915             | 31. $\begin{array}{r} 304 \\ - 215 \\ \hline \end{array}$<br>89            | 32. $\begin{array}{r} 385 \\ + 89 \\ \hline \end{array}$<br>474                | 33. $\begin{array}{r} 284 \\ - 57 \\ \hline \end{array}$<br>227                     |
| 34. $\begin{array}{r} 740 \\ - 461 \\ \hline \end{array}$<br>279             | 35. $\begin{array}{r} 500 \\ - 347 \\ \hline \end{array}$<br>153             | 36. $\begin{array}{r} 763 \\ + 442 \\ \hline \end{array}$<br>1,205         | 37. $\begin{array}{r} 5,683 \\ + 4,148 \\ \hline \end{array}$<br>9,831         | 38. $\begin{array}{r} 2,493 \\ - 1,507 \\ \hline \end{array}$<br>986                |
| 39. $\begin{array}{r} 7,835 \\ + 5,392 \\ \hline \end{array}$<br>13,227      | 40. $\begin{array}{r} \$4.64 \\ - 2.83 \\ \hline \end{array}$<br>\$1.81      | 41. $\begin{array}{r} \$3.27 \\ + 2.78 \\ \hline \end{array}$<br>\$6.05    | 42. $\begin{array}{r} \$60.97 \\ + 74.35 \\ \hline \end{array}$<br>\$135.32    | 43. $\begin{array}{r} \$84.06 \\ - 33.74 \\ \hline \end{array}$<br>\$50.32          |
| 44. $603 - 216$<br>387   | 45. $854 + 467$<br>1,321   | 46. $4,704 + 137$<br>4,841   | 47. $3,490 - 192$<br>3,298   |   |

**Mental math** Add or subtract mentally.

- |                        |                        |                            |                        |
|------------------------|------------------------|----------------------------|------------------------|
| 48. $641 + 235$<br>876 | 49. $827 - 603$<br>224 | 50. $9,000 + 500$<br>9,500 | 51. $740 - 200$<br>540 |
|------------------------|------------------------|----------------------------|------------------------|

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## Practice Game

### Target

**Number of players:** 2 or more

**Materials:** Number cube with the digits 0–5 or 1–6 on its sides

### Rules

1. For each round, players draw nine squares on a piece of paper as shown below.

+		

2. The teacher or a student tosses the number cube nine times and calls out the number thrown each time.

3. Players write each number in a square as it is called, trying to arrange the numbers so that the sum of them is as close as possible to 1,000. Numbers can be placed in any square.

4. Players find their sum. Then they find the difference between their sum and 1,000. If their score is less than 1,000, they subtract it from 1,000. If their score is more than 1,000, they subtract 1,000 from their score.

5. Play the game for five rounds.



**Estimation** Estimate each answer. **Actual answers are in parentheses.**

First round both numbers to the nearest ten.

52.  $127 + 48$     53.  $45 + 21$     54.  $82 - 49$     55.  $71 + 83$     56.  $184 - 92$   
**180 (175)**    **70 (66)**    **30 (33)**    **150 (154)**    **90 (92)**

First round both numbers to the nearest hundred.

57.  $386 - 153$     58.  $263 + 415$     59.  $3,097 - 587$     60.  $1,424 + 562$   
**200 (233)**    **700 (678)**    **2,500 (2,510)**    **2,000 (1,986)**

First round both numbers to the nearest thousand.

61.  $6,245 - 3,112$     62.  $7,705 + 2,187$     63.  $2,838 - 1,217$   
**3,000 (3,133)**    **10,000 (9,892)**    **2,000 (1,621)**

**Apply** Solve each problem.

64. Carmen bought 24 apples, 15 pears, and 36 plums. How many pieces of fruit did she buy altogether?

**75 pieces**

66. There are 345 food stores in the city and 679 in the suburbs. How many stores are there in the city and the suburbs in all?

**1,024 stores**

68. **CALCULATOR** The cash register tape at the right does not show the price of the bread. How much did the bread cost? How did you use your calculator to get the answer? Is there another sequence you could have used? Explain your method to another student. **\$1.78**

grocery	2.49
grocery	1.67
meat	5.74
bread	••••
dairy	1.38
dairy	1.89
Total	14.95

65. Carl bought groceries costing \$7.43. He paid for them with a \$10.00 bill. How much money did he get back?

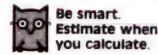
**\$2.57**

67. The Johnsons spent \$58.52 for food one week. The next week they spent \$62.35 for food. How much did they spend for food in those two weeks?

**\$120.87**

69. **Estimation** One grocery store chain has 2,842 stores and another has 1,127. About how many more stores does the larger chain have? Choose the best estimate.

2,000    3,000    4,000  
**2,000**



## Assignment Guide

basic	1–69 odd or even
average	1–63 odd or even, 64–69
enriched	1–63 odd or even, 64–69

## Follow-Up

Have students play the game that is described below the lesson pages.

## Calculator

The Olson family accounts for its expenses and income with a table like the one below.

Date	Income	Expenses	Balance
Oct. 20	\$762.49	—	\$762.49

Copy the table and enter the information below for each date. Then use your calculator to find each daily balance. Add each income amount to the previous daily balance. Subtract each expense amount from the previous daily balance.

October 21 Income:	\$383.22
October 22 Expenses:	94.95
October 23 Expenses:	500.00
October 24 Income:	149.26
October 25 Expenses:	103.26

[Balances—October 21: \$1,145.71; October 22: \$1,050.76; October 23: \$550.76; October 24: \$700.02; October 25: \$596.76]

## Daily Maintenance

This table shows the distance a plane flew each day. Use the table to solve each problem.

Day	Distance
Monday	2,183 kilometers
Tuesday	975 kilometers
Wednesday	1,641 kilometers

- Which is less, the distance the plane flew on Tuesday or on Wednesday? [Tuesday]
- To the nearest thousand kilometers, how far did the plane fly on Wednesday? [2,000 kilometers]
- On which day did the plane fly the farthest? [Monday]

See Using the Pages.

81

Seth 

4	5	4
---	---	---



3	3	6
---	---	---

Score 

6	4	2
---	---	---

  
 432    1, 4 3 2

Sara 

2	4	5
---	---	---

3	6	4
---	---	---

Score 

3	4	6
---	---	---

  
 45    9 5 5

**Scoring:** After each round, the score for each player is the difference between that player's sum and 1,000.

**The Winner:** The scores for the five rounds are added. The player having the lowest total score is the winner.



## Objective 32

Solve problems by writing equations involving addition and subtraction.

### Lesson Theme

Social Studies: Pony Express

## Introduction

**Motivational Situation** Pose the following problem to the students. What types of things affect how much it will cost to mail a letter? [Size of the letter, where it is going, sending special delivery, insured, overnight] What types of things are involved in delivering the mail? [Number of workers needed for collecting, sorting, transporting, and delivering the mail, printing of stamps, delivery of packages, modes of transportation]

Students may be interested to know that the Pony Express originated in 1860 and was terminated in 1861, when the first continental telegraph line was completed.

## Using the Pages

**Teach** Go over each step in the problem-solving process using the example. List the facts from the *Read* step on the board. Have students utilize the *Plan* step by choosing the operation to use. Discuss why addition is the correct operation. [The two distances are joined.] Write the equation on the board. Be sure students understand that  $n$  stands for the missing piece of information (total distance). Solve for  $n$ . Make sure students notice that the *Look Back* step assures that the question has been answered and that a reasonable answer has been provided.

**Try Estimation** Have students estimate each answer before they compute. Then have students explain their equations and answers.

**Apply Problem Solving** Students improve their problem-solving skills by discussing the problems before they do the work. Encourage students to follow the 5-step plan for each problem. Be sure to emphasize the need for deciding which operation they must use and then writing an equation to show this.

**Error Analysis** Watch for students who skip writing the equation in the *Plan* step. Use **Reteaching 32** with students who make this error.

### Problem Solving

### Write an Equation

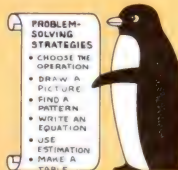
An **equation**, like a number sentence, can be used to show how the parts of a problem are related.

In 1860, the mail was carried across the West by the Pony Express. The journey took 8 to 10 days.

The Pony Express trail covered a distance of 995 miles from St. Joseph, Missouri, to Green River in the Utah Territory. The distance covered from Green River to Sacramento, California, was 971 miles. What was the total distance covered by the Pony Express trail?

**Read** Facts: 995 miles, 971 miles  
Find: Total distance

**Plan** Write an addition equation to show that joining the two parts of the journey gives the total distance. Use  $n$  for the total distance.



Distance from St. Joseph to Green River	Distance from Green River to Sacramento	Total distance
995	971	$n$

$$995 + 971 = n$$

**Solve**

$$\begin{array}{r} 995 \\ + 971 \\ \hline 1,966 \end{array}$$

Estimate:  
 $1,000 + 1,000 = 2,000$

$$n = 1,966$$

**Answer** The total distance covered by the trail was 1,966 miles.

**Look Back** The estimate of 2,000 miles is close to 1,966 miles. The answer is reasonable.



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## Practice 32

Write an equation. Then give the answer.

P32

Radio station KPDO organized a hike to raise money for a charity.

1. 348 people who worked for the station signed up to hike. 247 of them were there on the day of the hike. How many of the people who signed up did not make the hike?

$$\begin{array}{r} 348 - 247 = n \\ \hline 101 \text{ people} \end{array}$$

2. The hikers drank 564 glasses of water at Checkpoint 1 and 355 glasses at Checkpoint 2. How many glasses of water did they drink in all at the two checkpoints?

$$\begin{array}{r} 564 + 355 = n \\ \hline 919 \text{ glasses} \end{array}$$

3. It was 10 miles from the starting line to Checkpoint 4. The distance from Checkpoint 4 to the finish line was 15 miles. How many miles long was the hike?

$$\begin{array}{r} 10 + 15 = n \\ \hline 25 \text{ miles} \end{array}$$

4. Of the 247 people from the radio station who started the hike, only 94 finished. How many of them did not finish?

$$\begin{array}{r} 247 - 94 = n \\ \hline 153 \text{ people} \end{array}$$

5. 378 students from Morgan School, 145 students from Hill School, and 246 students from Shoreland School also made the hike. In all, how many students from these three schools made the hike?

$$\begin{array}{r} 378 + 145 + 246 = n \\ \hline 769 \text{ students} \end{array}$$

6. Out of all the people who started the hike, 117 stopped at Checkpoint 1. 285 stopped at Checkpoint 2. How many people in all stopped at these two checkpoints?

$$\begin{array}{r} 117 + 285 = n \\ \hline 402 \text{ people} \end{array}$$

## Reteaching 32

R32

At the end of July, Sue's corn plant had grown 58 inches. The plant grew another 14 inches in August. How tall was Sue's corn plant at the end of August?

Write an equation.  
Give the answer.

Sue's corn plant was 72 inches tall by the end of August.

$$\begin{array}{r} 58 \text{ inches} \\ + 14 \text{ inches} \\ \hline 72 \text{ inches} \end{array}$$

Write an equation.  
Give the answer.

1. Three watermelons weighed 24 pounds, 31 pounds, and 12 pounds. How much did all the watermelons weigh?

$$\begin{array}{r} 24 + 31 + 12 = n \\ \hline 67 \text{ pounds} \end{array}$$

2. Joe planted 324 green beans. James planted 172 green beans. How many more bean seeds did Joe plant?

$$\begin{array}{r} 324 - 172 = n \\ \hline 152 \text{ seeds} \end{array}$$

3. In July, 147 pounds of tomatoes were picked. In August, 243 more pounds were picked. How many pounds of tomatoes were picked in all?

$$\begin{array}{r} 147 + 243 = n \\ \hline 390 \text{ pounds} \end{array}$$

4. Carol planted 48 sunflower seeds in her garden. But 14 seeds did not grow. How many young sunflower plants grew in her garden?

$$\begin{array}{r} 48 - 14 = n \\ \hline 34 \text{ plants} \end{array}$$

5. In June, Janelle picked 3 peppers from her pepper plant. She picked 9 peppers in July and 13 peppers in August. How many peppers did her plant produce during these months?

$$\begin{array}{r} 3 + 9 + 13 = n \\ \hline 25 \text{ peppers} \end{array}$$



## Assignment Guide

basic	1-6
average	1-7
enriched	1-8

**More Practice Set 32,**  
page 363

## Follow-Up

**Reteaching** Do Problems 1, 3, 5, and 6 again, substituting different numbers. Or reword some of the problems using one-digit numbers.

**Enrichment** *Use data from outside the text* Have students write a report on the Pony Express. They should include two problems in their stories. This will involve writing and solving equations based on the information they find.

## Calculator

Have students use the number chart below. Tell them to box in several  $2 \times 2$ ,  $3 \times 3$ , and  $4 \times 4$  arrays. Then have them use their calculators to find the sum of the two diagonals in each array. They should discover that the sums of the diagonals in each array are the same. Some examples are shown.

100	101	102	103	104	105	106
107	108	109	110	111	112	113
114	115	116	117	118	119	120
121	122	123	124	125	126	127
128	129	130	131	132	133	134
135	136	137	138	139	140	141
142	143	144	145	146	147	148

$$101 + 109 = 210$$

$$102 + 108 = 210$$

$$111 + 119 + 127 = 357$$

$$113 + 119 + 125 = 357$$

$$121 + 129 + 137 + 145 = 532$$

$$124 + 130 + 136 + 142 = 532$$

## Cooperative Learning Groups

See page 476 of this Teacher's Edition.

## Daily Maintenance

Add or subtract. Check each answer.

1. $\begin{array}{r} 29 \\ + 16 \\ \hline [45] \end{array}$	2. $\begin{array}{r} 395 \\ - 174 \\ \hline [221] \end{array}$	3. $\begin{array}{r} 59 \\ + 88 \\ \hline [147] \end{array}$
4. $\begin{array}{r} 1,594 \\ + 762 \\ \hline [2,356] \end{array}$	5. $\begin{array}{r} 672 \\ - 583 \\ \hline [89] \end{array}$	6. $\begin{array}{r} 5,008 \\ - 2,126 \\ \hline [2,882] \end{array}$

**Try** Write an equation. Then give the answer.

- a. When most horses cost about \$48 each, Pony Express horses cost about \$150. How much more did a Pony Express horse cost?  
 $150 - 48 = n$  **\$102**

- b. A rider weighed about 125 pounds. He carried about 20 pounds of mail and 8 pounds of supplies. What was the total weight?  
 $125 + 20 + 8 = n$  **153 pounds**

**Apply** Write an equation. Then give the answer.

1. There were 80 Pony Express riders. One trip across the trail used 26 of these riders. How many riders were not used on that trip?  
 $80 - 26 = n$  **54 riders**

3. On the first day, the riders rode 263 miles. On the last day, they rode 195 miles. How much shorter was the ride on the last day than on the first?  
 $263 - 195 = n$  **68 miles**

5. Bill Cates rode 92 miles. Tommy Ranahan rode 52 miles farther than Bill. How far did Tommy ride?  
 $92 + 52 = n$  **144 miles**

7. Bart Riles rode 119 miles of the trail from Fort Churchill to Ruby Valley. Jay Kelley rode the remaining 118 miles. What was the distance from Fort Churchill to Ruby Valley?  
 $119 + 118 = n$  **237 miles**

2. Four riders were used between Green River and Camp Floyd. The distances they rode were 78, 54, 76, and 77 miles. What was the total distance they traveled?  
 $78 + 54 + 76 + 77 = n$  **285 miles**

4. In 1860, it cost about \$160 per pound to send mail by Pony Express. The cost in 1861 was \$32 per pound. How much more did it cost in 1860?  
 $160 - 32 = n$  **\$128 more**

6. Jack Keetley rode 105 miles. Dan Wescott rode 28 miles less than Jack. How far did Dan ride?  
 $105 - 28 = n$  **77 miles**

8. In 1861, it cost \$32.00 to send one pound of mail by Pony Express. In 1983, it cost \$2.58 to send one pound of mail. How much more did it cost in 1861 than in 1983?  
 $32.00 - 2.58 = n$  **\$29.42 more**

More Practice Set 32, page 363 **83**

## Enrichment 32

**Animal Equations** E32

For each picture write an addition or subtraction problem. Then write the equation that can be used to solve the problem.

Answers will vary.

1. 2. 3. 4. 5.

## Additional Resource 32

**Mental Math: Subtracting Nines** Additional Resource 32

45 - 9 = 36  
45 - 10 = 35  
35 + 1 = 36  
So 45 - 9 = 36

To subtract 9 from a number, you can subtract 10 and then add 1. Here's how:  
10 is 1 too many. So add 1.

Subtract mentally.

1. $36 - 9 = 27$	2. $53 - 9 = 44$
3. $67 - 9 = 58$	4. $82 - 9 = 73$
5. $55 - 9 = 46$	6. $31 - 9 = 22$
7. $70 - 9 = 61$	8. $48 - 9 = 39$
9. $123 - 9 = 114$	10. $115 - 9 = 106$
11. $148 - 9 = 139$	12. $172 - 9 = 163$
13. $153 - 9 = 144$	14. $178 - 9 = 169$
15. $236 - 9 = 227$	16. $284 - 9 = 275$
17. $353 - 9 = 344$	18. $453 - 9 = 444$
19. $753 - 9 = 744$	20. $953 - 9 = 944$
21. $53 - 9 = 44$	22. $67 - 9 = 58$



## Chapter 3 Test

An acceptable score for each objective is suggested in the Chapter 3 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

Objectives	Test items	Text pages
20	1, 3	52–53
21	5	54–55
22	6, 7	56–57
23	8, 9	58–59
24	10, 11	60–61
25	2, 4	64–65
26	12	66–67
27	13, 14	68–69
28	15, 16	70–71
29	17, 18	72–73
30	19, 20	76–77
31	21, 22	78–79
32	23–25	82–83

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
25	100	18	72
24	96	17	68
23	92	16	64
22	88	15	60
21	84	14	56
20	80	13	52
19	76		

**Additional Ideas for Evaluation**  
See pages 464–467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 3 Form for Individualizing
- Cumulative Record Folder

## Chapter 3 Test

Estimate each answer. First round both numbers to the nearest ten.

$$\begin{array}{r} 1. \quad 67 + 32 \\ \hline 100 \end{array} \quad \begin{array}{r} 2. \quad 88 - 43 \\ \hline 50 \end{array}$$

Estimate each answer. First round both numbers to the nearest hundred.

$$\begin{array}{r} 3. \quad 281 + 314 \\ \hline 600 \end{array} \quad \begin{array}{r} 4. \quad 743 - 212 \\ \hline 500 \end{array}$$

Rename. Write the standard form.

thousands	hundreds	tens	ones
5	7	24	3
<b>5,943</b>			

Add.

$$\begin{array}{r} 6. \quad 327 \\ + 58 \\ \hline 385 \end{array} \quad \begin{array}{r} 7. \quad 1,406 \\ + 2,534 \\ \hline 3,940 \end{array} \quad \begin{array}{r} 8. \quad 273 \\ + 149 \\ \hline 422 \end{array}$$

$$\begin{array}{r} 9. \quad 5,845 \\ + 3,627 \\ \hline 9,472 \end{array} \quad \begin{array}{r} 10. \quad 36 \\ + 42 \\ + 58 \\ \hline 136 \end{array} \quad \begin{array}{r} 11. \quad 363 \\ + 257 \\ + 195 \\ \hline 815 \end{array}$$

Rename to show 10 more tens.

thousands	hundreds	tens	ones
4	1	9	6
<b>4,019</b>			

Subtract.

$$\begin{array}{r} 13. \quad 85 \\ - 36 \\ \hline 49 \end{array} \quad \begin{array}{r} 14. \quad 637 \\ - 208 \\ \hline 429 \end{array} \quad \begin{array}{r} 15. \quad 5,203 \\ - 4,270 \\ \hline 933 \end{array}$$

$$\begin{array}{r} 16. \quad 634 \\ - 275 \\ \hline 359 \end{array} \quad \begin{array}{r} 17. \quad 902 \\ - 546 \\ \hline 356 \end{array} \quad \begin{array}{r} 18. \quad 4,007 \\ - 2,519 \\ \hline 1,488 \end{array}$$

Check each answer. Tell whether it is right or wrong. If it is wrong, give the correct answer.

$$\begin{array}{r} 19. \quad 6,029 \\ - 4,258 \\ \hline 1,831 \\ \text{Wrong; } 1,771 \end{array} \quad \begin{array}{r} 20. \quad 453 \\ + 507 \\ \hline 960 \\ \text{Right} \end{array}$$

Add or subtract.

$$\begin{array}{r} 21. \quad \$8.67 \\ - 3.94 \\ \hline \$4.73 \end{array} \quad \begin{array}{r} 22. \quad \$35.26 \\ + 24.74 \\ \hline \$60.00 \end{array}$$

Write an equation. Then give the answer.

23. Rosa bought a camera for \$68.49 and a case for \$9.75. How much did she spend in all?  
 **$68.49 + 9.75 = n$  \$78.24**
24. It is 2,762 miles from New York to San Diego. From New York to Seattle it is 2,815 miles. How much farther from New York is it to Seattle than to San Diego?  
 **$2,815 - 2,762 = n$  53 miles**
25. It is 965 miles from Boston to Chicago and 996 miles from Chicago to Denver. How far is it from Boston to Denver through Chicago?  
 **$965 + 996 = n$  1,961 miles**

## Chapter 3 Letter Home

### Keeping You Posted

In mathematics, we have been studying addition and subtraction exercises like those in the activity below. You might have your child apply addition and subtraction skills to everyday situations, such as adding the number of miles traveled on a trip. We will study measurement next.

To: Family

What animal nearly always lands on its feet when it falls?

To find out, work each exercise. Then connect the dots in the order the answers are given.

$$\begin{array}{r} 1. \quad 256 \\ + 134 \\ \hline 390 \end{array}$$

$$\begin{array}{r} 2. \quad 353 \\ + 447 \\ \hline 800 \end{array}$$

$$\begin{array}{r} 3. \quad 5,705 \\ + 2,298 \\ \hline 8,003 \end{array}$$

$$\begin{array}{r} 4. \quad 497 \\ + 218 \\ \hline 715 \end{array}$$

$$\begin{array}{r} 5. \quad 4,745 \\ + 2,835 \\ \hline 7,580 \end{array}$$

$$\begin{array}{r} 6. \quad 3,375 \\ + 2,477 \\ \hline 5,852 \end{array}$$

$$\begin{array}{r} 7. \quad 2,431 \\ + 6,749 \\ \hline 9,180 \end{array}$$

$$\begin{array}{r} 8. \quad 6,179 \\ + 2,465 \\ \hline 8,644 \end{array}$$

$$\begin{array}{r} 9. \quad 1,436 \\ + 823 \\ \hline 2,259 \end{array}$$

$$\begin{array}{r} 10. \quad 4,367 \\ + 1,575 \\ \hline 5,942 \end{array}$$

$$\begin{array}{r} 11. \quad 6,004 \\ + 3,142 \\ \hline 9,146 \end{array}$$

$$\begin{array}{r} 12. \quad 1,607 \\ + 2,465 \\ \hline 4,072 \end{array}$$

## Chapter 3 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

### Posttest Chapter 3

Estimate each answer. First round both numbers to the nearest ten.

1.  $76 + 33$       2.  $67 - 21$

Estimate each answer. First round both numbers to the nearest hundred.

3.  $469 + 128$       4.  $837 - 472$

Rename. Write the standard form.

5.

thousands	hundreds	tens	ones
4	1	9	6

Add

6.  $518 + 64$       7.  $1,647 + 2,103$       8.  $156 + 179$

9.  $5,407 + 2,783$       10.  $28 + 53 + 61$       11.  $243 + 396 + 173$

Rename to show 10 more tens.

12.

thousands	hundreds	tens	ones
3	4	6	8

### Posttest Chapter 3

Subtract

13.  $83 - 24$       14.  $462 - 108$       15.  $7,502 - 6,540$

16.  $527 - 349$       17.  $803 - 478$       18.  $5,001 - 1,237$

Check each answer. Tell whether it is right or wrong. If it is wrong, give the correct answer.

19.  $7,018 - 4,623 = 2,385$       20.  $573 + 381 = 954$

Add or subtract

21.  $73.9 - 44.5$       22.  $542.98 + 370.2$

Write an equation. Then find the answer.

23. Abdul bought a camera for \$75.69 and a case for \$9.28. How much did he spend in all?  
 **$75.69 + 9.28 = n$  \$84.97**

24. It is 1,108 miles from Atlanta to Boston. From Atlanta to Philadelphia it is 748 miles. How much farther from Atlanta is it to Boston than to Philadelphia?  
 **$1,108 - 748 = n$  360 miles**

25. It is 127 miles from San Diego to Los Angeles and 387 miles from Los Angeles to San Francisco. How far is it from San Diego to San Francisco through Los Angeles?  
 **$127 + 387 = n$  514 miles**



## Mental Math Strategies

Kay is a wizard at math. Often, she can do addition and subtraction mentally.

This is how Kay does it.



Compute mentally.  
Use your mind  
to save you time.

a.  $63 + 24 =$  ■

$60 + 20 = 80$

$3 + 4 = 7$

$80 + 7 = 87$

The answer is 87.

c.  $58 + 37 =$  ■

$58 + 30 = 88$

$88 + 7 = 95$

The answer is 95.

e.  $78 - 35 =$  ■

$78 - 30 = 48$

$48 - 5 = 43$

The answer is 43.

b.  $98 + 56 =$  ■

98 is 2 less than 100.

$100 + 56 = 156$

$156 - 2 = 154$

The answer is 154.

d.  $132 - 97 =$  ■

97 is 3 less than 100.

Add 3 to both numbers.

$135 - 100 = 35$

The answer is 35.

Find each sum or difference mentally.

1.  $52 + 37$

89

2.  $99 + 43$

142

3.  $86 - 45$

41

4.  $132 - 99$

33

5.  $47 - 19$

28

6.  $68 - 27$

41

7.  $28 + 44$

72

8.  $44 + 37$

81

9.  $124 - 98$

26

10.  $97 + 58$

155

11.  $17 + 46$

63

12.  $76 - 18$

58

13.  $28 + 47$

75

14.  $73 - 56$

17

15.  $157 - 97$

60

16.  $145 + 96$

241

17.  $253 + 38$

291

18.  $224 + 398$

622

19.  $402 + 167$

569

20.  $532 - 299$

233

85

## Mental Math Strategies

This page reviews some strategies that have been taught earlier and introduces some new strategies.

Discuss each of the examples with the students. Let them share other mental computation shortcuts they use.

Example A suggests computing from left to right, adding the tens and ones separately and then adding those sums. This could be done with numbers in the hundreds as well. Example B suggests adding and subtracting a small amount to eliminate the need to rename in addition.

Example D suggests adding a small amount to each number to eliminate the need to rename in subtraction. Example E uses a strategy similar to the one in Example A, subtracting the tens, then subtracting the ones.

You may wish to have students write down the answers in Exercises 1–20.

Answers, pages 52–53

e. 103; 839; 8,976; 2,918

If both numbers are rounded up (down) to get the estimated sum, the actual sum will be less (greater) than the estimated sum.

If one number is rounded up and the other rounded down to get the estimated sum, the actual sum can be either greater than or less than the estimated sum.

25. Greater than: 2, 4, 10

Less than: 5, 8

Cannot tell: 1, 3, 6, 7, 9

Answers, page 63

67–68.  $4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 5 + 5 =$

or  $4 + 4 + 4 + 4 + 4 + 4 + 4 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 =$

or  $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 =$



## Using Problem-Solving Strategies

- Use physical models.

### Materials

- Toy car
- Coins (Punchouts)

### Introduction

Students solve this problem by going through the transactions of buying and selling with play money.

### Using the Page

To give your students a concrete example of this problem, select four students to enact the situation: Zelda and 3 customers. Have customer #1 hold the physical model, the toy car. Customer #2 should be given 60¢ in play coins and customer #3 85¢ in play coins. Suggest that Zelda start with a certain amount of money, for example 70¢. [50 + 10 + 5 + 5]

Have students act out the buying and selling described in the problem. First, Zelda buys the car from customer #1 for 50¢. She now has 20¢ left and the car. Then Zelda sells the car to customer #2 for 60¢. She has 20¢ + 60¢ or 80¢.

At this point students should be able to solve Problem 1. Since Zelda started with 70¢ and has 80¢ after selling the car, she made 80¢ - 70¢ or 10¢.

Next Zelda buys back the car for 75¢ from customer #2. Zelda has 5¢ and the car. Finally, she sells the car to customer #3 for 85¢. Zelda has 5¢ + 85¢ or 90¢.

Students can now solve Problem 2. Since Zelda started with 80¢ before she bought the car the second time and had 90¢ when she sold it the second time she made 90¢ - 80¢ or 10¢ on the second sale.

To solve Problem 3, students need to remember that Zelda had 70¢ to start with and that she ended with 90¢. She made a total of 90¢ - 70¢ or 20¢.

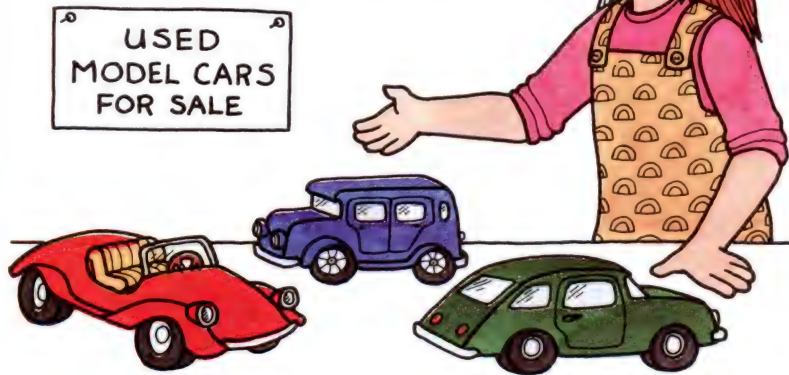
Students should be encouraged to reenact the situation a few times varying the amount of money that Zelda starts with (at least 65¢). They will find that the resulting amount of money that Zelda makes remains the same, 20¢.

In Problem 4, Zelda made 40¢ - 20¢ or 20¢ on the first sale. To make 30¢ altogether she needs to make an additional 10¢ on the second sale. Since she buys the car back for 50¢ she must sell it for 50¢ + 10¢ or 60¢.

## Using Problem-Solving Strategies

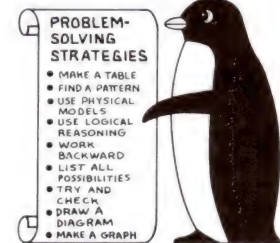
# ZELDA'S USED CARS

Zelda buys and sells used toys. She bought a model car for 50¢ and later sold it for 60¢. A customer told her that he wanted to buy that same model to complete his collection. He was willing to pay 85¢. Zelda bought back the car for 75¢ and then sold it to him for 85¢. Did Zelda make or lose money? How much?



1. When Zelda bought the car for 50¢ and sold it for 60¢, did she make or lose money? How much? **Made 10¢**
2. When Zelda bought the car back for 75¢ and sold it for 85¢, did she make or lose money? How much?  
**Made 10¢ on the single transaction**
3. How much money did she make or lose in all? **Made 20¢**
4. If Zelda bought a model car for 20¢, sold it for 40¢, and bought it back for 50¢, how much would she have to sell it for to make 30¢ altogether? **60¢**

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.



86

This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 400



## Cumulative Test, Chapters 1–3

Give the letter for the correct answer.

1. Which number sentence is correct?

**C**  
**A**  $27 > 51$       **C**  $17 < 51$   
**B**  $7 > 15$       **D**  $71 < 37$

2. Add.

**A**  

$$\begin{array}{r} 3 \\ + 6 \\ \hline \end{array}$$
**A** 9      **B** 8  
**C** 10      **D** 3

3. Subtract.

**B**  

$$\begin{array}{r} 9 \\ - 2 \\ \hline \end{array}$$
**A** 8      **B** 7  
**C** 6      **D** 11

4. Add.

**C**  

$$\begin{array}{r} 6 \\ 3 \\ + 4 \\ \hline \end{array}$$
**A** 17      **B** 9  
**C** 13      **D** 15

5. Tell whether you *add* or *subtract*.

**B** Solve the problem.

There were 6 girls and 8 boys at the party. How many students were at the party?

- A** Subtract; 14 students  
**B** Add; 14 students  
**C** Add; 2 students  
**D** Subtract; 2 students

6. Find the missing addend.

**C**  $5 + n = 12$   
**A** 8      **B** 16      **C** 7      **D** 17

7. Give the standard form for two hundred thirty-seven.

**A** 37      **C** 237  
**B** 327      **D** 273

8. Give the standard form for

**B**  $8,000 + 200 + 11$ .

**A** 8,112      **C** 8,021  
**B** 8,211      **D** 8,210

9. Which number sentence is correct?

**D**  
**A**  $4,383 < 3,265$   
**B**  $9,110 < 1,919$   
**C**  $7,829 > 7,842$   
**D**  $4,283 > 4,274$

10. Round 436 to the nearest ten.

**B**  
**A** 430      **C** 400  
**B** 440      **D** 500

11. Round 3,482 to the nearest

**A** thousand.  
**A** 3,000      **C** 3,500  
**B** 3,400      **D** 4,000

12. What does the 2 mean in 203,734?

**C**  
**A** 2 ten-thousands  
**B** 2 tens  
**C** 2 hundred-thousands  
**D** 2 ones

## Cumulative Test, Chapters 1–3

The following objectives are covered in this cumulative test. An asterisk preceding the number indicates that the objective is a target objective.

Objective	Test items	Text pages
* 2	1	4–5
* 3	2	6–7
* 4	3	8–9
* 6	4	14–15
* 7	5	16–17
8	6	18–19
10	7	26–27
* 11	8	28–29
12	9	30–31
* 14	10	34–35
15	11	36–37
17	12	42–43
19	13	46–47
21	14	54–55
22	15	56–57
* 23	16	58–59
* 24	17	60–61
27	18	68–69
* 28	19	70–71
29	20	72–73
31	21	78–79
32	22	82–83

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
22	100	16	73
21	95	15	68
20	91	14	64
19	86	13	59
18	82	12	55
17	77	11	50

## Additional Ideas for Evaluation

See pages 464–467.

## Record Forms

- Class Test Record Form
- Student Test Record Form
- Cumulative Record Folder

## Cumulative Test, Chapters 1–3

Name: \_\_\_\_\_

Circle the letter for the correct answer.

**Cumulative Test**  
Chapters 1–3

1. Which number sentence is correct?  
**A**  $34 < 18$       **C**  $24 < 18$   
**B**  $24 < 9$       **D**  $18 < 26$

2. Add.  

$$\begin{array}{r} 1 \\ + 9 \\ \hline \end{array}$$
**A** 10      **B** 9  
**C** 8      **D** 11

3. Subtract.  

$$\begin{array}{r} 10 \\ - 4 \\ \hline \end{array}$$
**A** 7      **B** 6  
**C** 5      **D** 14

4. Add.  

$$\begin{array}{r} 4 \\ 7 \\ + 3 \\ \hline \end{array}$$
**A** 11      **B** 13  
**C** 14      **D** 10

5. Tell whether you *add* or *subtract*. Solve the problem.  
 There were 9 boys and 8 girls in the school play. How many students were in the school play?  
**A** Subtract; 17 students  
**B** Add; 17 students  
**C** Add; 1 student  
**D** Subtract; 1 student

6. Find the missing addend.  
 $m + 4 = 10$   
**A** 4      **B** 12      **C** 6      **D** 14

7. Give the standard form for nine hundred sixty-four.  
**A** 96      **C** 964  
**B** 946      **D** 64

8. Give the standard form.  
 $7,000 + 500 + 1$   
**A** 7,510      **C** 7,105  
**B** 7,501      **D** 7,051

9. Which number sentence is correct?  
**A**  $9,236 < 9,246$   
**B**  $5,546 < 5,545$   
**C**  $4,709 < 4,790$   
**D**  $6,702 < 6,721$

10. Round 721 to the nearest ten.  
**A** 730      **C** 700  
**B** 720      **D** 800

11. Round 7,812 to the nearest thousand.  
**A** 8,000      **C** 7,800  
**B** 7,900      **D** 7,000

12. What does the 6 mean in 642,389?  
**A** 6 thousands  
**B** 6 hundreds  
**C** 6 hundred-thousands  
**D** 6 ten-thousands

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name: \_\_\_\_\_

**Cumulative Test**  
Ch. 1–3 (cont.)

13. Choose the most sensible answer.  
 The largest class at Kennedy School has 27 students. How many students are in the smallest class?  
**A** 1      **C** 37  
**B** 50      **D** 21

14. Rename. Give the standard form.  

$$\begin{array}{ccccccc} \text{hundreds} & \text{tens} & \text{ones} & \text{tens} & \text{ones} \\ 2 & 8 & 14 & 5 & 9 \\ \hline \end{array}$$
**A** 2,846      **C** 2,945  
**B** 2,955      **D** 2,855

15. Add.  

$$\begin{array}{r} 268 \\ + 709 \\ \hline \end{array}$$
**A** 977      **B** 961  
**C** 971      **D** 967

16. Add.  

$$\begin{array}{r} 372 \\ + 479 \\ \hline \end{array}$$
**A** 841      **B** 851  
**C** 751      **D** 741

17. Add.  

$$\begin{array}{r} 35 \\ 54 \\ + 37 \\ \hline \end{array}$$
**A** 116      **B** 113  
**C** 123      **D** 126

18. Subtract.  

$$\begin{array}{r} 617 \\ - 384 \\ \hline \end{array}$$
**A** 333      **B** 233  
**C** 273      **D** 373

19. Subtract.  

$$\begin{array}{r} 440 \\ - 85 \\ \hline \end{array}$$
**A** 355      **B** 525  
**C** 455      **D** 365

20. Subtract.  

$$\begin{array}{r} 400 \\ - 226 \\ \hline \end{array}$$
**A** 126      **B** 274  
**C** 284      **D** 174

21. Add.  

$$\begin{array}{r} 5573 \\ + 238 \\ \hline \end{array}$$
**A** 5811      **B** 5711  
**C** 5701      **D** 5801

22. Choose the equation that should be used to solve the problem. Then solve the problem.  
 Mrs. Fernandez drove 267 miles on Monday and 309 miles on Tuesday. How many more miles did she drive on Tuesday than on Monday?  
**A**  $309 - 267 = n$ , 576 miles  
**B**  $267 + 42 = n$ , 225 miles  
**C**  $309 + 42 = n$ , 351 miles  
**D**  $309 - 267 = n$ , 42 miles

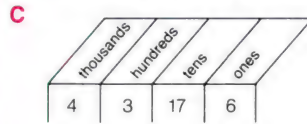


13. Choose the most sensible answer.

**D** The smallest class in Jonesville School has 20 students. How many students are in the largest class?

**A** 10    **B** 15    **C** 20    **D** 30

14. Rename. Give the standard form.



**A** 4,377    **C** 4,476  
**B** 4,496    **D** 4,386

15. Add.

**A**

$$\begin{array}{r} 248 \\ + 346 \\ \hline \end{array}$$

**A** 594  
**B** 593  
**C** 694  
**D** 584

16. Add.

**B**

$$\begin{array}{r} 564 \\ + 289 \\ \hline \end{array}$$

**A** 843  
**B** 853  
**C** 753  
**D** 743

17. Add.

**D**

$$\begin{array}{r} 48 \\ 25 \\ + 83 \\ \hline \end{array}$$

**A** 146  
**B** 143  
**C** 113  
**D** 156

18. Subtract.

**B**

$$\begin{array}{r} 438 \\ - 292 \\ \hline \end{array}$$

**A** 246  
**B** 146  
**C** 166  
**D** 266

19. Subtract.

**A**

$$\begin{array}{r} 460 \\ - 78 \\ \hline \end{array}$$

**A** 382  
**B** 412  
**C** 82  
**D** 392

20. Subtract.

**D**

$$\begin{array}{r} 500 \\ - 119 \\ \hline \end{array}$$

**A** 319  
**B** 491  
**C** 391  
**D** 381

21. Add.

**A**

$$\begin{array}{r} \$7.25 \\ + 1.96 \\ \hline \end{array}$$

**A** \$9.21  
**B** \$8.11  
**C** \$8.21  
**D** \$9.11

22. Choose the equation that should be used to solve the problem. Then solve the problem.

Mrs. Toruella drove 248 miles on Monday and 311 miles on Tuesday. How many more miles did she drive on Tuesday than on Monday?

**A**  $311 + 248 = n$ ; 559 miles  
**B**  $311 + 64 = n$ ; 375 miles  
**C**  $248 - 63 = n$ ; 185 miles  
**D**  $311 - 248 = n$ ; 63 miles



# chapter 4

## Measurement

### Mathematical Background

**Measurement** Measurement units developed historically from various arbitrary sources such as the distance a Roman legion marched in 2,000 paces (mile), or the length of three barley corns (inch). Two measurement systems, metric and customary, are officially recognized in the United States. Students should understand both.

**The Metric System** This interrelated system was developed as a complete package. The basic units—the meter, the liter, and the gram—were based on physical properties, such as the size of the earth and the weight of water. Both Latin and Greek prefixes are used. Common prefixes are the following:

- milli-* means one thousandth (0.001)
- centi-* means one hundredth (0.01)
- deci-* means one tenth (0.1)
- kilo-* means one thousand (1,000)

By combining a prefix with a standard unit, additional measurement units are established. For example, a *kilogram* (kg) is 1,000 grams, and a *kilometer* (km) is 1,000 meters. Temperatures are measured with a Celsius system for which each degree represents one hundredth (0.01) of the range between the freezing point of water (0°C) and the boiling point of water (100°C).

**The Customary System** Unlike the metric system, the customary system has no consistent procedure for naming the various measurement units. One must memorize the relationships between units. One must know, for example, that a foot equals 12 inches, or, equivalently, that an inch is one twelfth of a foot.

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### Pretest for Chapter 4

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 4**

1. Write the time shown on the clock.  1. 6:40

2. What time will it be 25 minutes later than the time shown on the clock above? 2. 7:05

3. What is the date of the third Monday in June? 3. 18

4. What day of the week is June 23? 4. Saturday

Measure the length to the nearest centimeter. 5. 2 cm

Measure the length to the nearest inch. 6. 3 inches

Choose the most sensible measure. 7. 13 cm

13 cm 13 dm 13 m

Name \_\_\_\_\_

**Pretest Chapter 4**  
*continued*

8. Height of a door. 2 dm 2 m 2 km 8. 2 m

9. Weight of a juice glass. 160 g 160 kg 9. 160 g

10. Amount of water in a birdbath. 6 mL 6 L 10. 6 L

11. Height of a basketball net. 10 in. 10 ft. 10 mi. 11. 10 ft.

12. Length of a bridge. 30 in. 30 yd. 30 mi. 12. 30 yd.


13. Weight of a rocking chair. 15 ounces 15 pounds 15 tons. 13. 15 pounds

14. Amount of liquid in a glass of milk. 1 c. 1 gal. 14. 1 c.

15. Temperature of a refrigerator. 40° F 80° F 15. 40° F

16. Hiking weather. 15° C 55° C 16. 15° C

17. Choose the most sensible estimate for the distance from the pond to the tree. 1 km 2 km 3 km 17. 3 km





# Teaching Chapter 4



## Problem Solving

**Five-Step Method** Throughout this chapter on measurement, remind students as they do the *Apply* problems, about the importance of *Looking Back* to make sure their answers are reasonable.

**Problem-Solving Strategies** The emphasis in this chapter is on “real-world” measurement situations. Pages 104–105 focus on the important strategy of *Using estimation*. The nonroutine problems in the *Using Problem-Solving Strategies* features on pages 114–115, 120, 416, and 417 give students a chance to *Draw a diagram*, *Make a table*, *Find a pattern*, *Work backward*, and *Solve a simpler problem*.

You'll want to be a facilitator rather than a director of the problem-solving activities in this chapter. It is a good idea to have the students do the thinking, make the decisions, measure and experiment, and find ways to solve the problems.



## Estimation and Mental Math

**Estimation** In this chapter, students use estimation to decide which unit of measure is most sensible. They also estimate to choose the best measure among several options.

If students are having difficulty choosing the best unit or the best measure, it is a good idea to encourage them to eliminate the options that make no sense.

Throughout this chapter, after students become familiar with each unit of measure, they should be encouraged to estimate measures first, then make an actual measurement. As an additional activity, you may wish to present **Math Poster L**. You might allow students several days to estimate the shortest path on the poster, and then have them measure to check their estimates. By estimating first and then measuring, students will learn to make better estimates.

On page 119, students are shown *front-end* estimation with adjusting. This estimation strategy is shown with addition and can easily be extended to subtraction. You might want to tell students that this strategy is often easier to use and can be more accurate than using rounding to estimate. You can suggest to students that they might want to make their own comparisons.



## Calculators and Computers

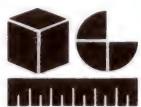
**Calculators** An activity entitled, *Choosing a computation method*, is featured as a calculator activity in every chapter. Students are instructed to choose the most appropriate computation method—using a calculator, paper and pencil, or mental arithmetic—to solve the exercises. Encourage students to make decisions about the best method to use in each situation. They should see that some types of computation are better done mentally, while others should be worked with paper and pencil or a calculator.

**Computers** In **Additional Resource 40**, students use the PRINT statement with and without quotation marks around addition and subtraction exercises. In **Additional Resource 44**, students learn how to insert or change lines in a program. They also learn about REM statements. A very important part of a computer program is its documentation. The documentation within a program itself is supplied through REM (remark) statements. REM statements can be used to present the name or description of the program, and can also list the author and state the purpose of the program. REM statements are not printed in the output; they function as essential information to anyone reading the program.



It is important that students be able to decide whether a computation is better done mentally, worked with pencil and paper, or done with a calculator.





## Concrete Materials

When teaching measurement concepts, there is no substitute for having students measure familiar objects. In this chapter, students will get experience using a variety of measuring tools and devices by doing the activities suggested in the lesson notes. To explore time relationships, students are encouraged to use clocks and calendars. To become more familiar with measures of weight, students should begin by holding various weights in their hands and making comparisons. Then they can weigh some common objects. In other lessons, students will measure lengths, using rulers and tape measures. In additional lessons, they can make use of measuring cups, eyedroppers, and other assorted containers to experience measures of capacity. Students also should be able to use a thermometer to measure the temperature outdoors, indoors in the classroom, as well as learn the temperature of ice water, and that of warm water.

Before beginning this chapter, you might want to assemble the various measuring tools and devices students will need, and common objects of different sizes, which are to be measured. Good items to use with this chapter include index cards, paper clips, coins, pencils, books, drinking glasses, empty bottles, tin cans, sand, and beans.

After you finish the chapter, you can pull a lot of ideas together by encouraging students to find all the ways they can to measure 50 paper clips or 50 beans. They can lay them end-to-end to find their length. They can weigh them or put them in a cup to find their capacity. In addition, they can use a thermometer to find the temperature of the paper clips.



**There is no substitute for students measuring familiar objects themselves.**



## Teaching Techniques

**Questioning and Responding** It is important to ask students to estimate measures. It is also important to be careful how you respond to students' answers. Some students are better estimators than others because they have had more practice or are better visualizers. Be accepting of any answer that a student gives. As long as students aren't discouraged, they'll keep trying and will improve.

**Helping Students Read and Write Mathematics** When students read a chapter on measurement, they encounter many math terms (names of units of measure). Be sure all students can pronounce the terms correctly. Note that prefixes for metric units can help students remember what the words mean. When students write answers on paper, check their spelling of units of measure. You may wish to point out that *cm*, *mL*, *g*, and so forth are not abbreviations; they are symbols and as such are not followed by a period. Abbreviations for customary measures are followed by a period.

**Teaching Students with Special Needs** You can use the subject of measurement to foster the natural curiosity of your gifted students. You might have them investigate the metric system: Who invented it? When? Why? How is it used in the United States? As another activity, students can explore the measurement of time: Why are there 24 hours in a day? Have there always been 7 days in a week and 365 days in a year? Are there other calendars besides the one we use?

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

Health: food (106–107)

Reading: fantasy (104–105)

Science: animals (100–101)



## Thinking Skills

In this chapter, students follow rules and procedures for reading a clock. They comprehend concepts and apply concepts as they get a feel for the size of units of measure and then use that to choose sensible measures. The *Using Problem-Solving Strategies* feature on page 417 involves students in analyzing relationships. Throughout the chapter, a good way to promote higher order thinking skills is to ask students to explain how they figured out their answers.



## Bulletin Board Suggestions

The posters shown here can be used with Chapter 4. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster K



Math Poster L



Math Poster M

## Materials Chapter 4

- Clock (Punchouts) 90–91
- Newspaper 90–91, 96–97
- Current year calendar 92–93
- Counters (Punchouts or Math Kit) 92–93
- Centimeter rulers (Teaching Aid G, Punchouts, or Math Kit) 94–97, 102–105
- Metric tape measures (Teaching Aid G or Math Kit) 96–97
- Kilogram and gram weights (Math Kit) 98–99
- Hanger 98–99
- S-hooks 98–99
- Balance (Math Kit) 98–99, 110–111
- Measuring cups (Math Kit) 100–101, 112–113
- Eyedropper 100–101
- Sand, rice, or beans 100–101
- Inch rulers (Teaching Aid F, Punchouts, or Math Kit) 106–109, 120
- Tape measure (Math Kit) 106–109
- Yardstick 108–109
- Ounce and pound weights (Math Kit) 110–111
- Pint, quart, gallon containers 112–113
- Thermometer (Math Kit) 116–117



**Basic Situation**

Use the picture on this page to motivate a discussion about how people keep track of time. Have students name different units of time and explore the basis for each of them. You might want to have students work in groups to prepare items to be part of a display on time.

**Possible Problems**

- Is each unit of time always the same length? Are all years the same length? All months? All days? All hours?
- Which units of time are natural? Which are made up by people?
- How many days are in each month?
- How does leap year affect the calendar? Is this a leap year? If not, when will the next leap year be? Does a leap year occur every four years?
- What is daylight savings time? How does it affect what time it is? Why do some areas use daylight savings time?
- When will the 21st century begin?

**Indicators of Success**

Students will want to discuss how to collect information suggested by the above questions or other questions that they might have. Students might suggest using library sources, such as the almanacs or encyclopedias. Other students might suggest asking older people.

Students may suggest that the information found be displayed on a bulletin board. Some students may use tables, charts, or graphs to organize and present their findings.

**Ways to Help**

Some students may never have heard of almanacs, and so they will need some help with finding information from them.

You will want to pay particular attention to the first two lessons of this chapter to make sure that the students know how to use a clock and a calendar. The study of these lessons may help to spark some ideas for questions to explore.



**Tuesday, January 3, 4:15 P.M.**

In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

**Background Information****Leap Years**

If a solar year were exactly  $365\frac{1}{4}$  days, it would be a perfect scheme to add an extra day to February every 4 years. But a solar year is a bit less than that. To correct for the extra time, the years ending with 00 are leap years only if the year is a multiple of 400. So 1700, 1800, and 1900 were not leap years, but 2000 will be. (Even with this correction, the calendar is not perfectly matched to the solar cycle.)

**Centuries**

A century is 100 years. The first century was the years 1 through 100. The 20th century runs from 1901 through 2000. Thus, the 21st century will begin January 1, 2001.

**Natural vs. Made-Up Units of Time**

A day is the amount of time it takes for the earth to make one rotation on its axis. A year is the amount of time it takes for the earth to make one orbit around the sun. They are units dictated by nature. Other units of time—seconds, minutes, hours, weeks, months, centuries—are units devised by people. It is true that the length of a month is close to a natural unit, the time it takes the moon to orbit the earth, about 29 days, 12 hours, 44 minutes, and 3 seconds.

**Daylight Savings Time**

Daylight Savings Time extends from the last Sunday in April to the last Sunday in October, the interval when daylight periods are longest.



## Objective 33 (Target Objective)

Tell time using standard and digital clocks.

### Vocabulary

Midnight, noon

### Materials

- Clock (Punchouts)
- Newspaper

### Introduction

**Warm-Up Review** Have students review counting by fives from 0 to 60.

**Using Concrete Materials** Have students use a display clock and move the hands to show what time they get up, leave for school, begin school, and finish school. Review which hand of the clock is the hour hand and which hand is the minute hand. Then have students work in pairs; have one student move the hands around the display clock, and have the other student tell the time to the nearest 5 minutes.

### Using the Pages

**Teach** Read and discuss each example. Ask students how many minutes in an hour [60], how many hours in a day [24], how many hours of A.M. [12], how many hours of P.M. [12] Point out that the hands of the clock are in the same place for a particular time, for example, 2:10, whether it is A.M. or P.M.

**Mental Math** Have students count up to find out how many minutes it is from one time to another. For example, to find the time from 3:40 to 4:20, have the students count 5, 10, 15, 20 minutes to 4:00, plus 20 minutes past 4:00 equals 40 minutes.

**Try** The clocks in Exercises a and b are called analog clocks, while the clock in Exercise c is called a digital clock. Discuss how to tell time using the digital clock.

**Practice** Ask students what they would do to tell minutes before an hour using a digital clock. [Subtract the minutes shown on the clock from 60]

**Apply Problem Solving** In Problem 9, encourage students to think about the hours between 9:00 P.M. and midnight, and the hours between midnight and 7:00 A.M.

**Using data from outside the text** Have students find the time of sunrise and sunset for a particular day in the newspaper. Ask them to compute the hours and minutes of daylight.

### Time: Clock

- a.** Show the times 3:00, 3:25, and 3:52 on a standard clock and on a digital clock.

The short hand is the hour hand. It moves from one number to the next in 60 minutes, or 1 hour.

The long hand is the minute hand. It moves from one number to the next in 5 minutes.

The minute hand moves from one small mark to the next in 1 minute.



3:00 A.M., 3:25 A.M., and 3:52 A.M. are between *midnight* and *noon*.

3:00 P.M., 3:25 P.M., and 3:52 P.M. are between *noon* and *midnight*.

- b.** At 8:30, how many minutes is it until 9:50?

- c.** What time will it be 45 minutes later than 6:55?

How many minutes until 9:00? 30

It is 50 more minutes until 9:50.

Count the minutes to get to 7:00.

Continue counting until you have counted 45 minutes in all.



$$30 + 50 = 80$$



The time will be 7:40.

At 8:30, it is 80 minutes until 9:50.

90

### Practice 33

Name \_\_\_\_\_ P33

Complete the table. Write the time shown. Then write the other indicated times.

	Time Shown	3 Hours Later	30 Minutes Later	15 Minutes Later
	2:15	5:15	2:45	2:30
	4:05	7:05	4:35	4:20
	5:55	8:55	6:25	6:10
	11:50	2:50	12:20	12:05

Solve each problem.

1. School starts at 8:30 A.M. It is over at 3:00 P.M. School is how many hours long?

6  $\frac{1}{2}$  hours

2. The play lasts for 2 hours and 15 minutes. It will begin at 7:30 P.M. When will it end?

9:45 P.M.

3. Juanita started jogging at 4:15 P.M. She jogged for 40 minutes. What time did she stop?

4:55 P.M.

4. Mr. Martin goes to sleep at 11:00 P.M. and wakes up at 7:00 A.M. How many hours does he sleep?

8 hours

### Reteaching 33

Name \_\_\_\_\_ R33

What time is shown on the clock?

First look at the hour (short) hand. It is between the 4 and the 5. The time is between 4:00 and 5:00.



4:15

Then look at the minute (long) hand. It moves from one number to the next in 5 minutes. You can count by 5s. The minute hand shows 15 minutes after the hour.

The time is 4:15.



Count by 5s. 4:25

Write the time 10 minutes later.

Write the time shown in clock A. In clock B, draw the time shown 10 minutes later. Write the new time.





**Try** Write the time shown. Then write the time indicated under the clock.

a.



3 hours later  
4:10, 7:10

b.



20 minutes later  
7:45, 8:05

c.



12 minutes later  
6:38, 6:50

**Practice** Write the time shown. Then write the time indicated under the clock.

1.



4 hours later  
11:05, 3:05

2.



30 minutes later  
8:30, 9:00

3.



15 minutes later  
4:50, 5:05

4.



40 minutes later  
1:40, 2:20

5.



14 minutes later  
8:29, 8:43

6.



9 minutes later  
10:14, 10:23

**Apply** Solve each problem.

7. Band practice begins at 3:30 and lasts until 4:45. How many minutes does band practice last?  
**75 minutes**
8. Kristi goes to sleep at 9 P.M. She wakes up at 7 A.M. How many hours does she sleep?  
**10 hours**
9. The school day starts at 9 A.M. It ends at 3:00 P.M. How many hours long is the school day?  
**6 hours**
10. The concert lasts for 2 hours and 30 minutes. It will begin at 7:30 P.M. When will it end?  
**10:00 P.M.**
11. Lunch period begins at 11:45 and ends at 12:15. How many minutes is lunch period?  
**30 minutes**
12. Eduardo started jogging at 3:45. He jogged for 35 minutes. What time did he stop?  
**4:20**

More Practice Set 33, page 363 91

## Assignment Guide

basic	1–9
average	1–10
enriched	1–12

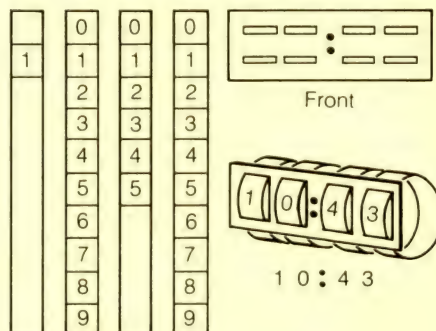
More Practice Set 33,  
page 363

## Follow-Up

**Extra Practice** Have each student make a table to show how much time in hours is spent in various activities each day. Remind the students that there are 24 hours in a day. Include activities such as sleeping, eating, and studying both in school and out of school, playing, and so on.

**Reteaching** Encourage students to use the display clock to do any exercise that is difficult for them.

**Enrichment** Have students make digital-clock models as shown below, with a cardboard front and paper-strip digits fastened into circles.



## Enrichment 33

Name \_\_\_\_\_ E33

**Is It Morning or Night?**

What time will it be 8 hours after 9 P.M.?

Begin at the 9 on the clock and count 8 hours.

9 P.M. + 8 hours is 5 A.M.

Use the clock to find the answers.

- 6 A.M. + 10 hours is 4:00 P.M.
- 11 A.M. + 4 hours is 3:00 P.M.
- 7 P.M. + 11 hours is 6:00 A.M.
- 10 P.M. + 4 hours is 2:00 A.M.

What time was it 6 hours before 2 A.M.?

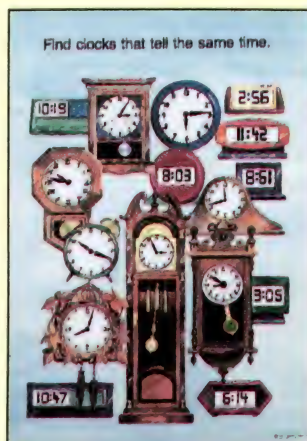
Begin at the 2 on the clock and count back 6 hours.

2 A.M. - 6 hours is 8 P.M.

Use the clock to find the answers.

- 7 A.M. - 9 hours is 10:00 P.M.
- 1 P.M. - 8 hours is 5:00 A.M.
- 3 A.M. - 7 hours is 8:00 P.M.
- 6 P.M. - 11 hours is 7:00 A.M.

## Additional Resource 33



### Math Poster K Time: Clock

Point to the grandfather clock and ask which digital clock shows the same time. [2:56] See Answer Key for other uses of this poster.

## Daily Maintenance

**Estimation** Have students estimate each answer before computing. Then have them compare their estimate with their computed sum.

- 63 + 19 [80; 82]
- 329 + 247 [500; 576]
- 2,362 + 1,574 [4,000; 3,936]
- 28 + 45 [80; 73]
- 538 + 445 [900; 983]
- 4,825 + 7,026 [12,000; 11,851]



**Objective 34** (Target Objective)  
Read and interpret a calendar.

### Materials

- Current year calendar
- Counters (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Have students bring a current year calendar to class. Review the names of the months. Ask students how many months are in a year. [12] Point out that the number of days varies month to month. Ask students to complete this sentence: "A month can have as many as [31] days and as few as [28] days." Have the students name months that you describe, such as, "This month has 30 days and is near the beginning of the school year." [September] "This is the last month of the year to have four letters in its name." [July] "This month is assigned the extra day in a leap year." [February] Ask in which month the following holidays occur: New Year's Day [January], President's Day [February], Memorial Day [May], Independence Day [July], and Labor Day [September]. Point out that some holidays always fall on the same day of the week, and therefore the date of those holidays changes from year to year. State that some holidays always have the same date, and therefore the day of the week on which they fall changes from year to year.


## Using the Pages

**Teach** Ask what day follows Thursday [Friday], what day comes just before Tuesday [Monday], what month is the month before March [February], and what month comes just after October [November]. Show how to find what day of the week a particular date is and how to find the date of a certain day. Discuss how to determine the date for "a week ago today," "two weeks from tomorrow," and so on. Have the students determine the dates indicated by such phrases. Point out that using a calendar in this way involves addition and subtraction of 7. Explain the abbreviations on the calendar for the days of the week. Point out that the table shows equal amounts of time.

**Practice Estimation** In Exercises 15–18, have students defend their answers by explaining why the other choices were not sensible.

**Calculator** Students can use addition or multiplication to answer Problem 19. (Continued on page 93.)

## Time: Calendar

			
<b>January</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>February</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	<b>March</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>April</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
			
<b>May</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>June</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	<b>July</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>August</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
			
<b>September</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	<b>October</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>November</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	<b>December</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

The 12 months of the year are named on this calendar.

The days of the week are Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.

Here is a table to help you measure time.

60 seconds = 1 minute	7 days = 1 week	366 days = 1 leap year
60 minutes = 1 hour	12 months = 1 year	10 years = 1 decade
24 hours = 1 day	365 days = 1 year	100 years = 1 century

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## Practice 34

Name \_\_\_\_\_

P34

July							August						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
							1	2	3	4	5	6	7
8	9	10	11	12	13	14	8	9	10	11	12	13	14
15	16	17	18	19	20	21	15	16	17	18	19	20	21
22	23	24	25	26	27	28	22	23	24	25	26	27	28
29	30	31					29	30	31				

Use the calendar to name the day or date.

- Second Thursday in July  
July 8
- One week from July 11  
July 18
- August 7  
Saturday
- Third Sunday in August  
August 15
- Six weeks after July 4  
August 15
- Two days after August 22  
August 24
- July 31  
Saturday
- One week from August 25  
September 1
- July 12  
Monday
- August 3  
Tuesday

Circle the most sensible answer.

- The baseball season extends over 7 ( days, months, years )
- It takes Sam 20 ( minutes, hours, days ) to walk to school.
- August has 31 ( hours, days, weeks )
- A school day lasts 6 ( hours, days, months )
- Tom walked the dog for 30 ( minutes, hours, days )
- Sally's father is 38 ( hours, months, years ) old.

## Reteaching 34

Name \_\_\_\_\_

R34

On what day of the week is November 22?

September							October							November						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
							1	2	3	4	5	6	7	8	9	10	11	12	13	
13	14	15	16	17	18	19	14	15	16	17	18	19	14	15	16	17	18	19		
20	21	22	23	24	25	26	20	21	22	23	24	25	20	21	22	23	24	25		
27	28	29	30	31			27	28	29	30	31		27	28	29	30	31			

Find 22 on the November Calendar. Look at the top of the calendar to find the day of the week.

November 22 is on Thursday.

Name the day of the week for each date. Use the calendars shown above.

- November 5 Monday
- September 15 Saturday
- October 2 Tuesday
- October 31 Wednesday
- September 7 Friday
- November 25 Sunday

Circle the most sensible answer. How long does it usually take to

- eat dinner? 1 minute 1 hour 1 day
- watch a movie? 2 hours 2 days 2 weeks
- take a nap? 30 minutes 30 days 30 years
- go on spring vacation? 10 hours 10 days 10 months
- build a house? 6 hours 6 days 6 months
- visit the zoo? 2 seconds 2 minutes 2 hours



## Assignment Guide

basic	1–21
average	1–21
enriched	1–21

**More Practice Set 34,**  
page 364

(Continued from page 92.)

Explain to students that by using the answer from the previous problem, they can answer Problem 20 in one step using the following key sequence:  
525,600  $\times$  60  $=$ .

### Apply Problem Solving

**Use physical models** Have students work in groups. Give each group at least 50 counters. Tell the students the counters represent pennies. Ask the students what is the least number of pennies in Tammy's piggy bank? [20] Have them count out 20 counters. Ask the students what happens when Tammy counts her pennies by 5s. [There are 4 left over.] Have the students put their counters into groups of 5. Ask if there are any left over. [No] Tell them to add counters so there are 4 left over. How many counters are there in all? [24] Ask the students what happens when Tammy counts her pennies by 3s. [There is 1 left over.] Have the students divide their 24 counters into groups of 3. Are there any left? [No] Ask how many counters do you need to add to have 1 left over? [1] How many counters are there in all? [25] Have the students repeat the process of making groups of 5 and adding counters if necessary, then making groups of 3 and adding counters if necessary, until they arrive at a number of counters [34] for which all the requirements are filled.

## Follow-Up

**Extra Practice** Have students work Exercises 1–14 using the calendar for the current year.

**Enrichment** Have students make a calendar for the current month. Have them enter birthdays of family members, music lessons, and other events. Students could decorate the calendars with appropriate drawings.

## Daily Maintenance

- 324 – 86 [238]
- 571 – 99 [472]
- 913 – 648 [265]
- 3064 – 526 [2538]

**Try** Use the calendar on page 92 for Exercises a and b.

- Which day of the week is May 26?  
**Saturday**
- Give the date of the third Monday in November.  
**November 19**
- Estimation** Choose the most sensible answer.  
Jean's older sister is 16 (days, weeks, years) old.  
**Years**

**Practice** Use the calendar on page 92 for Exercises 1–14. Name the day of the week for each date.

- April 2  
**Monday**
- June 5  
**Tuesday**
- May 11  
**Friday**
- February 7  
**Wednesday**
- October 18  
**Thursday**
- March 24  
**Saturday**
- July 24  
**Tuesday**
- November 21  
**Wednesday**

Name the date for each day.

- Second Thursday in December  
**December 13**
- Third Wednesday in September  
**September 19**
- First Tuesday in February  
**February 6**
- Fourth Sunday in January  
**January 28**
- One week from March 8  
**March 15**
- Two weeks from August 27  
**September 10**

**Estimation** For Exercises 15 to 18, choose the most sensible answer.

- Sid slept 10 (minutes, hours, days) last night.  
**Hours**
- Fran walks to school in 20 (minutes, hours, months).  
**Minutes**
- There are about 4 (days, weeks, years) in 1 month.  
**Weeks**
- Calculator** How many minutes are in one year? Use the table on page 92.  
**525,600 minutes**
- April has 30 (days, weeks, months).  
**Days**
- Calculator** How many seconds are in one year? Use your answer to Problem 19 and the table on page 92.  
**31,536,000 seconds**

**Apply** Solve the problem.

- Tammy has at least 20 pennies in her piggy bank. When she counts the pennies by 5s, there are 4 left over. When she counts them by 3s, there is 1 left over. What is the least number of pennies that she can have?

**34 pennies**



More Practice Set 34, page 364 93

## Enrichment 34

Name \_\_\_\_\_

**January** E34

Use the January calendar to answer the questions.

Sun	Mon	Tues	Wed	Thur	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

- What is the date 10 days after January 2?  
January 12
- What is the date 15 days after January 3?  
January 18
- What is the date 12 days before January 23?  
January 11
- What is the date 2 days before January 6?  
January 4
- What is the date 17 days before January 25?  
January 8
- What is the date 3 days after January 27?  
February 1
- February 4 is on what day of the week?  
Tuesday
- What is the date 2 weeks after January 2?  
February 6
- What is the date on the first Saturday in February?  
February 1
- What is the date on the second Tuesday in February?  
February 11

## Additional Resource 34

Name \_\_\_\_\_

**Additional Resource 34**

**Calculator: Days and Minutes**

Below is a table of a typical school day for Kelly and a calendar for October. Use the table and the calendar to answer the questions.

Time period	Activity
7:30 to 8:00	Breakfast
8:00 to 8:30	Chores
8:30 to 9:00	Walk to school
9:00 to 11:30	In class
11:30 to 12:15	Lunch
12:15 to 3:00	In class
3:00 to 3:30	Walk home
3:30 to 4:15	Practice violin
4:15 to 6:30	Play
6:30 to 7:15	Dinner
7:15 to 8:00	Homework
8:00 to 9:00	Relax
9:00 to 7:30	Sleep

Su	M	T	W	Th	F	Sa
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

- How many hours does Kelly spend sleeping?  
10½ hours
- How many minutes does Kelly spend sleeping? (1 hour = 60 minutes)  
630 minutes
- How many minutes does Kelly spend at meals?  
120 minutes
- How many minutes does Kelly spend playing or relaxing?  
195 minutes
- How many minutes does Kelly spend doing homework each week? (There are 5 school days in a week.)  
225 minutes
- How many minutes does Kelly spend in class each week?  
1,575 minutes
- How many minutes does Kelly spend in class during October?  
7,245 minutes



## Objective 35

Measure objects to the nearest centimeter and choose an appropriate measure of length using centimeter or decimeter.

### Lesson Theme

Consumer Topics: Repair Shop

### Vocabulary

Centimeter, decimeter

### Materials

- Centimeter rulers (Teaching Aid G, Punchouts, or Math Kit)

## Introduction

Discuss jobs that require measuring length. [Carpenter, tailor, rug installer, drapery maker] Ask when students have measured length. [Projects, hobbies, schoolwork]

**Using Concrete Materials** Set up measuring stations in the classroom, displaying a variety of objects such as keys, pens, crayons, erasers, and sheets of notebook paper to be measured. Ask the students which unit, centimeter or decimeter, they would use to measure each object. Have the students estimate the length and/or width of each item and record their estimates on a sheet of paper. Then have the students measure the items and compare the measurements with their estimates. Discuss how to record measurements that fall between two centimeter marks on a ruler. Remind students that objects can never be measured exactly and have them record their measurements as *about* x centimeters or decimeters.

## Using the Pages

**Teach** Read the examples. Help students relate the units of measure to familiar objects. Explain that a centimeter is about the width of a student's little finger, while a decimeter is about the width of the back of a student's hand from the outside of the little finger to the outside of the thumb.

**Try** Stress that the symbols for centimeter (cm) and decimeter (dm) are written without a period and are not capitalized.

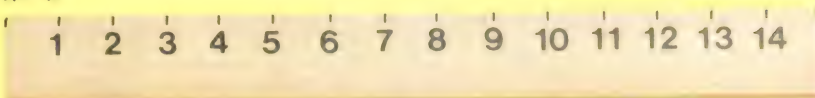
**Practice Error Analysis** Be sure students align the start of a segment they measure with the 0-mark on the ruler.

**Apply Problem Solving** You may wish to have students estimate the length of each object in Problems 11–14 as an oral activity before measuring.

## Centimeter and Decimeter

The *centimeter* and the *decimeter* are metric units of length.

- A. The length of this bolt is about one centimeter (1 cm).



- B. The length of this wrench is about one decimeter (1 dm).  
1 dm = 10 cm



## Practice 35

Name \_\_\_\_\_ P35

Estimate the length of each object to the nearest centimeter. Write your estimate in the first blank. Then measure each object. Write your result in the second blank.

- 4 cm
- 5 cm
- 3 cm
- 3 cm
- 4 cm
- 2 cm

What has teeth but never eats?

To find out, connect the star beside each exercise to the star in front of the best measure. Each line will go through a letter. Write that letter in the blank beside the measure.

- New pencil 1 dm **A**
- Baseball bat 3 dm **C**
- Man's shoe 3 cm **O**
- Straight pin 9 dm **M**
- Crayon 18 cm **B**

## Reteaching 35

Name \_\_\_\_\_ R35

Your smallest fingernail is about 1 centimeter wide.

10 cm = 1 dm

1 centimeter (cm)

1 decimeter (dm)

Estimate the length to the nearest centimeter. Then measure it.

Your measurement

- \_\_\_\_\_ 5 cm
- \_\_\_\_\_ 2 cm
- \_\_\_\_\_ 7 cm
- \_\_\_\_\_ 10 cm

Circle the more sensible measure

- 8 cm 8 dm
- 1 cm 1 dm
- 12 cm 12 dm
- 2 cm 2 dm
- 10 cm 10 dm
- 14 cm 14 dm



# Assignment Guide

basic	1-14
average	1-14
enriched	1-14

More Practice Set 35,  
page 364

## Follow-Up

**Extra Practice** Have pairs of students draw several segments, exchange papers, estimate the lengths, and then measure.

**Reteaching** Have students collect actual-size pictures of objects and paste the pictures on construction paper. They should then measure the objects in centimeters and record the measure on the back of the papers. Students could keep the pictures in folders and use them for future reference.

## Reading and Writing Mathematics

Encourage students to use the index by having them look up these terms. Then have them list some page numbers on which the terms appear: digits [pages 24, 25], expanded form [pages 28, 42, 43], standard form [pages 26, 27, 28, 42, 44, 49, 54, 55].

## Cooperative Learning Groups

See page 477 of this Teacher's Edition.

## Daily Maintenance

1.  $635 + 89$  [724]
2.  $368 + 593$  [961]
3.  $583 + 249$  [832]
4.  $1,739 + 4,541$  [6,280]
5.  $5,378 + 1,054$  [6,432]
6.  $6,409 + 629$  [7,038]

## Try

a. **Estimation** Estimate the length to the nearest centimeter. Then measure it.

4 cm

b. **Estimation** Tell if the measure is sensible. Write *yes* or *no*.

A pencil is about 1 dm long.

Yes



Estimation

**Practice** **Estimation** Estimate each length to the nearest centimeter. Then measure it.

1. 3 cm

2. 6 cm

3. 9 cm

4. 13 cm

**Estimation** Tell if the measure is sensible. Write *yes* or *no*.

5. This textbook is about 2 cm thick.

Yes

7. Your thumb is about 5 dm long.

No

9. A piece of chalk is about 7 dm in length.

No

6. A toothbrush is about 16 cm long.

Yes

8. A pony stands about 15 dm high.

Yes

10. A hockey stick is about 10 cm long.

No

**Apply** Measure each length to the nearest centimeter.

11.



15 cm

12.



12 cm

13.



1 cm

14.



3 cm

More Practice Set 35, page 364 95

## Enrichment 35

Name \_\_\_\_\_ E35

**Triangle Tangle**

Use a ruler to measure the lengths given in the following exercises.

1. On the line between B and C, mark points 5 centimeters and 13 centimeters from the point B. The first one is done for you. Connect each point to A.
2. On the line between A and B, mark points 4 centimeters and 1 decimeter from point B. Connect both points to C.
3. On the line between A and C, mark points 4 centimeters and 1 decimeter from point C. Connect both points to B.
4. There are more than 50 and less than 100 triangles in the design. How many triangles can you find?  
72 triangles

## Additional Resource 35



**Math Poster L Estimating and Measuring** The shortest path is the one on the far left. See *Answer Key* for ways to use this poster to teach estimation.



## Objective 36

Choose an appropriate measure of length using centimeter, decimeter, meter, or kilometer.

### Lesson Theme

Recreation: Bikes

### Vocabulary

Kilometer, meter

### Materials

- Centimeter rulers (Teaching Aid G, Punchouts or Math Kit)
- Metric tape measures (Teaching Aid G or Math Kit)
- Newspapers or magazines

### Introduction

Review the meaning of centimeter and decimeter. Have a student measure the height of the classroom door using a centimeter ruler. Discuss when measuring length in units larger than centimeters or decimeters would be more practical or convenient. [Measuring lengths of swimming pools or rivers; distances from city to city]

**Motivational Situation** Suppose you were planning a bicycle trip for your class. What are some things you would need to consider? [How many hours should the trip take? How much distance can be traveled in that time? Where do you want to go? What would be the safest route to take?]

### Using the Pages

**Teach** After discussing Example A, ask students to suggest measures that might be about one meter. [Height of a table, a giant step] Discuss Example B and give other examples for the size of a kilometer. [About 4 or 5 city blocks, about 11 football fields placed end-to-end]

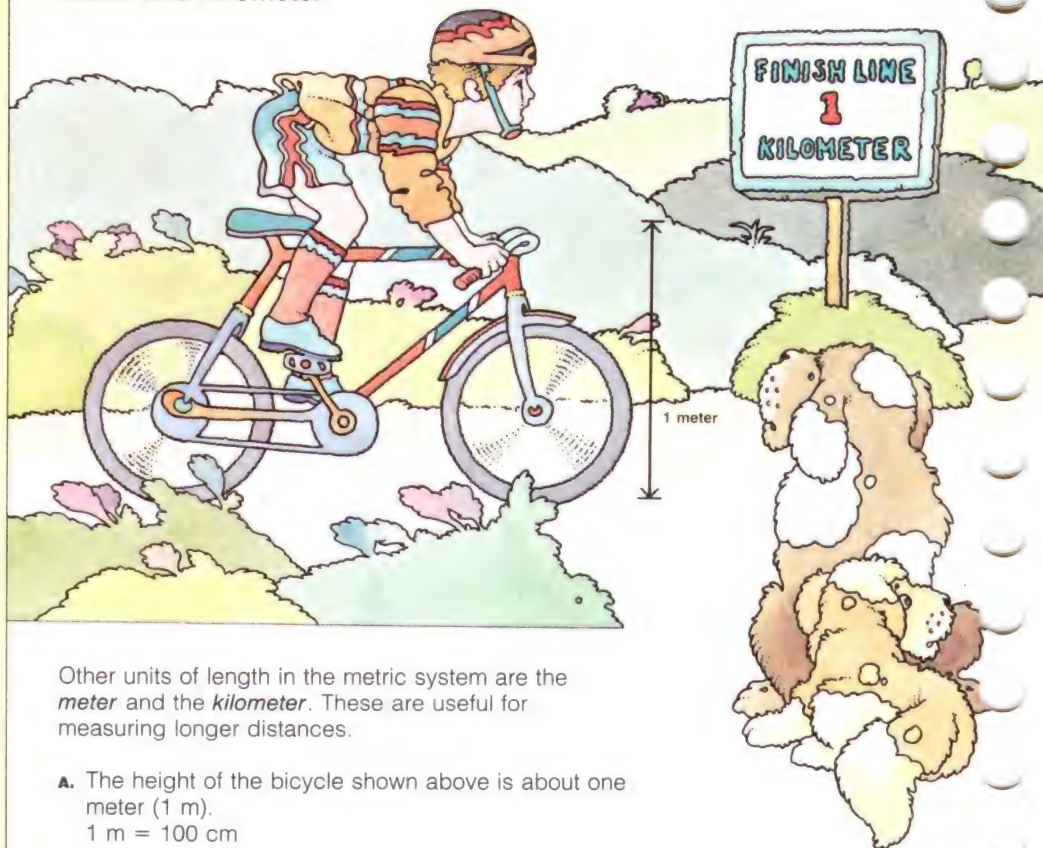
**Try** You may wish to discuss basketball before assigning these exercises.

**Practice Error Analysis** Watch for students who confuse the symbols in Exercises 7–12. Have these students make drill cards with a metric measure of length on the front of the card and its abbreviation on the back of the card. Have these students work in pairs to quiz each other.

**Apply Problem Solving** For each problem, ask several students to describe the problem-solving process that they used. Be sure students realize that often several strategies could be appropriate for the same problem.

**Use physical models** Students may like to act out Problem 14 using play money.

## Meter and Kilometer



Other units of length in the metric system are the **meter** and the **kilometer**. These are useful for measuring longer distances.

- The height of the bicycle shown above is about one meter (1 m).  
 $1\text{ m} = 100\text{ cm}$
- The total length of 571 bicycles is about one kilometer (1 km).  
 $1\text{ km} = 1,000\text{ m}$

### Try

- Estimation** Would you use centimeters, meters, or kilometers to measure the height of a basketball hoop?

**Meters**

- Estimation** Choose the most sensible measure for the height of a basketball player.

2 cm    2 m    2 km  
**2 m**

96

## Practice 36

Circle the unit you would use for each measure

1. Meters or Kilometers

2. Meters or Kilometers

3. Meters or Kilometers

4. Meters or Kilometers

5. Meters or Kilometers

6. Meters or Kilometers

Circle the more sensible measure

- Length of a bed: 275 cm, 275 m, 2 km
- Length of an ocean liner: 275 cm, 275 m, 275 km
- Height of an apple tree: 8 cm, 8 m, 8 km
- Distance a plane flies in 1 hour: 500 dm, 500 m, 500 km
- Length of a room: 5 mm, 5 cm, 5 m
- Height of a flagpole: 6 cm, 6 dm, 6 m
- Length of 10 city blocks: 2 dm, 2 m, 2 km
- Distance walked in 1 hour: 4 cm, 4 m, 4 km
- Length of a basketball court: 25 dm, 25 m, 25 km

## Reteaching 36

The meter (m) and the kilometer (km) are metric units of length

A baseball bat is about one meter long  
 $1\text{ m} = 100\text{ cm}$

1,000 baseball bats put end-to-end measure about one kilometer  
 $1\text{ km} = 1,000\text{ m}$

Match each object with the most sensible unit of measure

- 2 cm, 2 dm, 2 m
- 6 dm, 6 m, 6 km
- 10 cm, 10 dm, 10 m
- 2 cm, 2 dm, 2 m
- 6 dm, 6 m, 6 km
- 10 cm, 10 dm, 10 m





## Assignment Guide

basic	1-12
average	1-14
enriched	1-14

**More Practice Set 36,**  
page 364

## Follow-Up

**Extra Practice** Have students make a one-meter tape measure, using Teaching Aid G, and measure items or distances in the classroom with it.

**Reteaching** Have students make up cards for a measurement file box. Students should cut out pictures of objects from newspapers and magazines and paste them on 3 x 5 cards. On the front of each card they should show which type of measurement this card will be used for. In this case, *length* would be the appropriate word. On the back of each card, students should write whether the object could best be measured in *centimeters*, *decimeters*, *meters*, or *kilometers*. These cards can be used for future reference or for drill.

**Enrichment** Have the students use tape measures (as in Extra Practice) to measure the distance around the classroom in meters. Then find out how many times they would have to walk around the classroom to walk one kilometer.

**Practice Estimation** Would you use centimeters, meters, or kilometers to measure



- the height of a house?  
**Meters**
- the distance to France?  
**Kilometers**
- the length of your shoe?  
**Centimeters**
- the length of a soccer field?  
**Meters**
- the width of your classroom?  
**Meters**
- the distance an airplane flies in an hour?  
**Kilometers**

**Estimation** Choose the most sensible measure.

- |  |  |   |
|--|--|---|
| 7. Length of a cat<br>3 cm 3 dm 3 km<br><b>3 dm</b>      | 8. Height of a mountain<br>2 cm 2 m 2 km<br><b>2 km</b>            | 9. Width of a door<br>1 dm 1 m 1 km<br><b>1 m</b>               |
| 10. Length of a jump rope<br>2 cm 2 dm 2 m<br><b>2 m</b> | 11. Distance traveled on a bus<br>15 cm 15 m 15 km<br><b>15 km</b> | 12. Height of a golf trophy<br>30 cm 30 m 30 km<br><b>30 cm</b> |

**Apply** Solve each problem.

- Of the 27 bicycles needing repair in his shop, Mr. Branson fixed 14. How many still need to be repaired?  
**13 bicycles**
- Yuriko paid \$4.59 for a bicycle tire. Keith's tire cost \$1.40 more than Yuriko's tire. How much did Keith's tire cost?  
**\$5.99**

More Practice Set 36, page 364 97

## Enrichment 36

Name \_\_\_\_\_ E36

**Use a Map**

Use the map, the map scale, and a centimeter ruler to find the answers.

Give the distance in kilometers between

- Cold Springs Camp and Central Camp **5 km**
- Valley Camp and the fishing grounds **6 km**
- The fishing grounds and Meadow Camp **7 km**
- Pine Tree Camp and Lookout Point **8 km**
- Lookout Point and Highview Camp **7 km**
- Valley Camp and Pine Tree Camp **16 km**
- Highview Camp and Cold Springs Camp **10 km**

Circle the more sensible measure.

8. Length of a pine cone at Pine Tree Camp 12 cm 12 km	9. Length of Trout River 20 m 20 km	10. Height of a mountain at Lookout Point 750 m 750 km
---	--	---

## Additional Resource 36

Name \_\_\_\_\_ Additional Resource 36

**Maintenance**

Round each number to the nearest hundred.

1. 437 <b>400</b>	2. 1,565 <b>1,600</b>	3. 18,857 <b>18,900</b>
4. 183 <b>200</b>	5. 5,951 <b>6,000</b>	6. 3,081 <b>3,100</b>

Round each number to the nearest thousand.

7. 5,027 <b>5,000</b>	8. 5,612 <b>6,000</b>	9. 6,500 <b>7,000</b>
10. 4,567 <b>5,000</b>	11. 1,099 <b>1,000</b>	

Round each number to the nearest ten.

12. 68 <b>70</b>	13. 91 <b>90</b>
14. 5,264 <b>5,260</b>	15. 9,565 <b>9,570</b>

Round 4,517 to the nearest

16. ten <b>4,520</b>	17. thousand <b>5,000</b>
18. hundred <b>4,500</b>	

Round 5,050 to the nearest

19. ten <b>5,050</b>	20. thousand <b>5,000</b>
21. hundred <b>5,100</b>	

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- 503 - 347 [156]
- 200 - 175 [25]
- 608 - 99 [509]
- 5,600 - 2,355 [3,245]
- 2,402 - 157 [2,245]
- 3,600 - 1,247 [2,353]



## Objective 37

Choose an appropriate measure of weight (mass) using gram or kilogram.

### Lesson Theme

Careers: Veterinarian

### Vocabulary

Gram, kilogram

### Materials

- Balance (Math Kit)
- Kilogram and gram weights (Math Kit)

## Introduction

**Using Concrete Materials** Write the terms *gram* and *kilogram* on the board and explain that these are units of weight. Pass kilogram and gram weights around the room. Make sure that each student has the chance to handle the weights and compare the weight of a gram to the weight of a kilogram. Ask students the following questions: Which weight is heavier? [Kilogram] Do you think the kilogram is heavier than two grams? [Yes] Than 10 grams? [Yes] Than 100 grams? [Yes] Remind students that there are 1,000 meters in a kilometer and lead them to see there are also 1,000 grams in a kilogram.

## Using the Pages

**Teach** After discussing Examples A and B, help students relate metric units of weight to familiar objects. For example, two small paper clips weigh about one gram and their mathematics book weighs about one kilogram. Name many objects in the room and have the students decide if their weights should be given in grams or kilograms.

**Practice Estimation** Have students compare the weights of each item in Exercises 7–12 to objects they know weigh about 1 gram or 1 kilogram. For example, for Exercise 11 ask the students, “Does a dime weigh about the same as 2 nuggets of dog food or about the same as 2 puppies?” [2 nuggets of dog food]

**Apply Problem Solving** Students should include the appropriate symbol for the unit of measure for each problem.

**Choosing a computation method** Encourage students to discuss the reasons for their choices of a computation method. Discuss why a calculator would not be an efficient method for solving any of the problems. [All of the problems involve one operation with two numbers, and all of the numbers have less than four digits.]

## Gram and Kilogram

**Career** Dr. Masumi Kato is a veterinarian. She often uses metric units of weight. Two of these units are the *gram* and the *kilogram*.

- A nugget of this dog food weighs about one gram (1 g).
- The puppy weighs about one kilogram (1 kg).  
1 kg = 1,000 g



## Practice 37

Name: \_\_\_\_\_

What kind of trunk can be named with two letters of the alphabet? **P37**

To find out, circle the more sensible measure. In the diagram below, shade each section that contains an answer.

- Squirrel: 3 g 3 kg
- Football: 1 g 1 kg
- 10-year-old boy: 40 g 40 kg
- Quarter: 6 g 6 kg
- Loaf of bread: 600 g 600 kg
- Woman: 60 g 60 kg
- Car: 1,500 g 1,500 kg
- Pencil: 5 g 5 kg
- Can of soup: 340 g 340 kg
- Hammer: 500 g 500 kg
- Bar of soap: 75 g 75 kg
- Bus: 2,500 g 2,500 kg
- Pumpkin: 9 g 9 kg
- Key: 8 g 8 kg
- Auto tire: 18 g 18 kg
- Eraser: 20 g 20 kg
- Big paper clip: 2 g 2 kg
- Half-dollar: 11 g 11 kg
- Math book: 400 g 400 kg
- Apple: 140 g 140 kg

## Reteaching 37

Name: \_\_\_\_\_ **R37**

The gram (g) and the kilogram (kg) are metric units of weight.

A piece of dry cat food weighs about one gram.

A kitten weighs about one kilogram.  
1 kg = 1,000 g

Circle the more sensible measure.

1. Duck: 3 g 3 kg
2. Cow: 500 g 500 kg
3. Pig: 80 g 80 kg
4. Potato: 10 g 10 kg
5. Apple: 125 g 125 kg
6. Banana: 2 g 2 kg
7. Bag of rice: 50 g 50 kg
8. Box of cereal: 750 g 750 kg
9. Pencil: 25 g 25 kg
10. Box of crayons: 1 g 1 kg
11. Girl: 30 g 30 kg
12. Book: 1 g 1 kg



## Assignment Guide

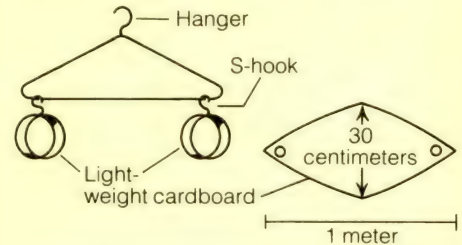
basic	1–16
average	1–16
enriched	1–16

**More Practice Set 37,**  
page 365

## Follow-Up

### Extra Practice *Using Concrete Materials*

Have students verify weight of various objects using a balance (Math Kit) or an improvised balance scale like the one shown below. Remember two small paper clips weigh about one gram and the student's mathematics book weighs about one kilogram.



**Reteaching** Have students make cards for their file boxes (*Reteaching*, page 97) that will show *weight*. On the back of each card, students should write whether the object could best be measured in *grams* or *kilograms*.

**Enrichment** In class, have the students make a table like the one below, enter five kinds of canned or boxed food, and estimate their weights.

Food	Estimated weight	Actual weight

Then have the students take home the partially completed tables and find and enter the actual weights as printed on the food labels. Have the students return the tables the next day to make a bulletin board display.

### Daily Maintenance

- $\$0.99 + \$0.73$  [ $\$1.72$ ]
- $\$6.77 + \$0.17$  [ $\$6.94$ ]
- $\$3.42 + \$8.83$  [ $\$12.25$ ]
- $\$1.89 + \$4.28$  [ $\$6.17$ ]
- $\$23.74 + \$3.62$  [ $\$27.36$ ]
- $\$56.18 + \$24.77$  [ $\$80.95$ ]

## Try

- a. **Estimation** Would you use grams or kilograms to measure the weight of a table tennis ball?

**Grams**

- b. **Estimation** Choose the more sensible measure for the weight of a bowling ball.

7 g    7 kg  
**7 kg**



Estimation

**Practice Estimation** Would you use grams or kilograms to measure the weight of

- a dollar bill? **Grams**
- a desk? **Kilograms**
- a paper clip? **Grams**
- a television set? **Kilograms**

- a bicycle? **Kilograms**
- a banana? **Grams**

**Estimation** Choose the more sensible measure.

- 9-year-old boy    38 g    38 kg  
**38 kg**
- Screwdriver    57 g    57 kg  
**57 g**
- Can of nuts    370 g    370 kg  
**370 g**
- Watermelon    3 g    3 kg  
**3 kg**
- Dime    2 g    2 kg  
**2 g**
- Roller skate    1 g    1 kg  
**1 kg**

**Apply Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used.

- Snoops, a basset hound, weighs 13 kg. Mac, an Irish setter, weighs 16 kg more than Snoops. How much does Mac weigh?  
**29 kg; M**
- This week, Dr. Kato treated 37 cats. She treated 8 fewer dogs than cats. How many dogs did she treat this week?  
**29 dogs; M, P**
- A small puppy ate 135 g of the 200 g of food it needs each day. How many more grams of food should it eat today?  
**65 g more; P**
- A beagle ate 350 g of food. A German shepherd ate 600 g of food. How much food did the two dogs eat?  
**950 g; M**



More Practice Set 37, page 365 **99**

## Enrichment 37

Name \_\_\_\_\_ **E37**

**Which is Heavier?**

For each object, circle the weight you think is closest to the actual weight.

- Apple    1 kg    150 g
- Brick    1 kg    35 kg
- Adult Man    90 kg    565 g
- Basketball    365 g    10 g
- Bicycle    13 kg    150 g
- Large Dog    1 kg    35 kg
- Can of Soup    305 g    35 kg
- Television    565 g    50 kg
- Paper Clip    305 g    1 g

List the objects in Exercises 1–9 in order by weight, starting with the lightest and ending with the heaviest. Then answer the ant's question.

- Paper Clip
- Apple
- Can of soup
- Basketball
- Brick
- Bicycle
- Large Dog
- Television
- Adult Man

10. What would you tell the ant? No, you do not.

Do I always have to weigh them to know which is heavier?

## Additional Resource 37

Name \_\_\_\_\_ **Additional Resource 37**

**Maintenance**

Estimate each answer. First round each number to the nearest hundred.

- $488 + 256$   
500 + 300 = 800
- $792 + 125$   
800 + 100 = 900
- $485 - 160$   
500 - 200 = 300
- $1,565 + 510$   
1,600 + 500 = 2,100
- $472 + 655$   
500 + 700 = 1,200
- $95 + 1,776$   
100 + 1,800 = 1,900
- $2,023 - 1,290$   
2,000 - 1,000 = 1,000
- $3,154 + 1,050$   
3,000 + 1,000 = 4,000
- $7,752 + 2,185$   
8,000 + 2,000 = 10,000
- $13,721 - 1,459$   
14,000 - 1,000 = 13,000

Solve each problem.

- Bill weighs 96 pounds. Sue and Kelly weigh 78 pounds each. What is the total weight of all three?  
252
- A small car weighs 2,375 pounds. The driver weighs 218 pounds. Will the total weight be over 2,500 pounds?  
Yes



## Objective 38

Choose an appropriate measure of capacity using milliliter or liter.

### Lesson Theme

Science: Animals

### Vocabulary

Milliliter, liter

### Materials

- Measuring cups (Math Kit)
- Eyedropper
- Sand, rice, or beans

### Introduction

Review the metric measures of length and weight. Tell students that today they will be learning about metric units used to measure capacity.

**Using Concrete Materials** Show the students a measuring cup containing a liter of water, sand, rice, or beans. Next show students an eyedropper with one milliliter of water. Ask students to estimate how many milliliters of liquid would be needed to fill the one liter cup. [1,000] Display a variety of containers and ask students to decide if each container will hold more or less than one liter. Have them verify their answer by pouring one liter of sand from the cup into the container in question.

### Using the Pages

**Teach** Read and discuss the examples. You might wish to explain to students that a quart container of milk, if it were completely full, would hold about one liter.

**Practice Error Analysis** Students may confuse weight and capacity or may have difficulty in recognizing them as two different measurements. Point out to students that the capacity of a container is how much it can hold. You may want to have students compare the weight of a liter container when it is filled with water, sand, rice, or beans.

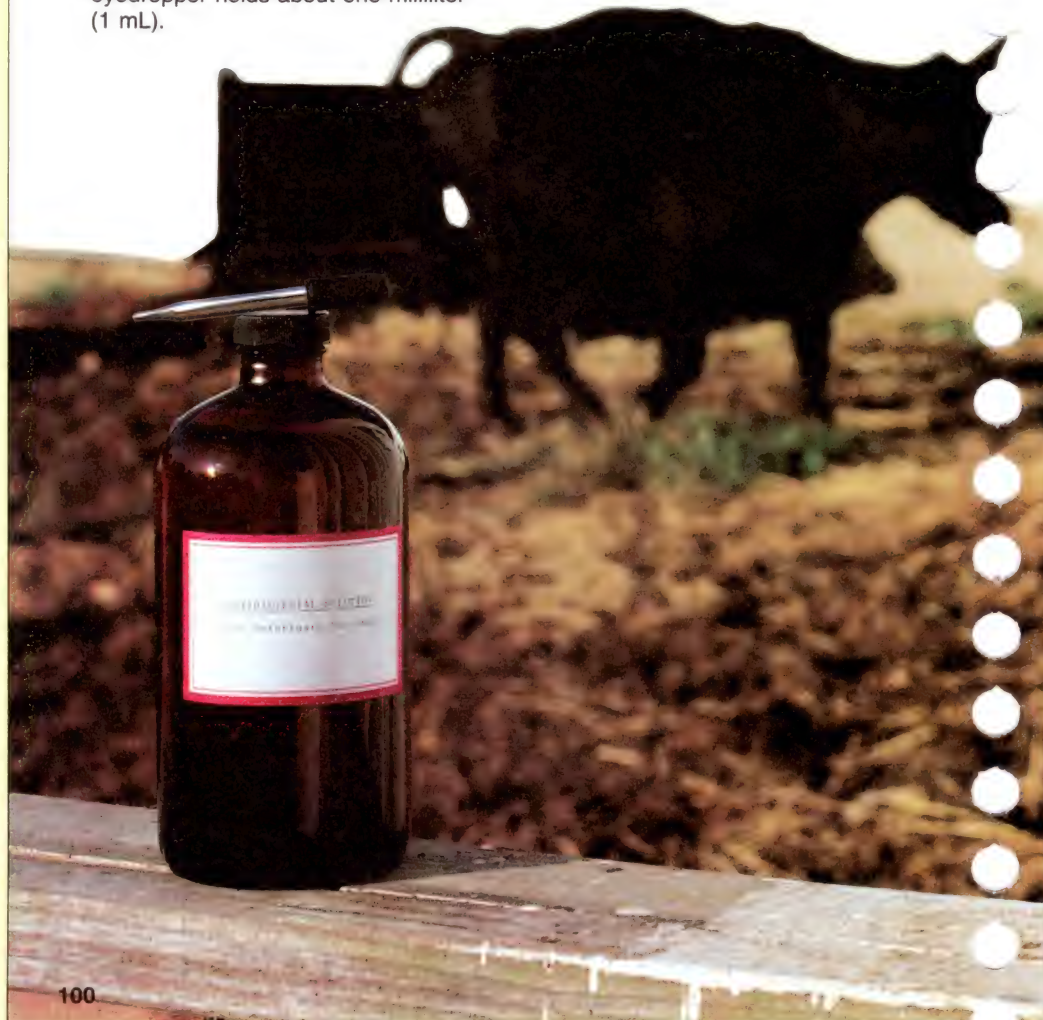
**Apply Problem Solving** Ask a student to read each problem aloud. Ask a student to describe the action in each problem and tell the operation that should be used to solve the problem.

**Calculator** To help students find the error in Problem 20, have them look at the addends and ask them what digit should appear in the ones place in the sum. [5] Explain that transposing two digits in a number is a common calculator error. Have students offer suggestions on how to avoid this type of error.

## Milliliter and Liter

*Milliliter and liter* are metric units used for measuring amounts of liquid.

- A.** To guard against disease, medicine is often put into a newborn animal's eyes with an eyedropper. An eyedropper holds about one milliliter (1 mL).
- B.** The medicine is stored in a bottle that holds about one liter (1 L).  
 $1 \text{ L} = 1,000 \text{ mL}$



### Practice 38

Circle the unit you would use to show how much each container holds.

1. 2. 3.   
Liters or milliliters      Liters or milliliters      Liters or milliliters

4. 5. 6.   
Liters or milliliters      Liters or milliliters      Liters or milliliters

Circle the more sensible measure.

7. Fish bowl: 5 mL or 5 L      8. Vitamin bottle: 30 mL or 30 L      9. Mixing spoon: 15 mL or 15 L

10. Trash can: 80 mL or 80 L      11. Wading pool: 120 mL or 120 L      12. Teakettle: 2 mL or 2 L

13. Gasoline can: 8 mL or 8 L      14. Glue bottle: 50 mL or 50 L      15. Perfume bottle: 20 mL or 20 L

### Reteaching 38

Metric units for measuring liquids are the *milliliter* (mL) and the *liter* (L).

An eyedropper holds about one milliliter of water.

The dog's water dish holds about one liter of water.  
 $1 \text{ liter} = 1,000 \text{ mL}$

Circle the more sensible measure.

1. 10 mL or 10 L      2. 3 mL or 3 L      3. 15 mL or 15 L

4. 100 mL or 100 L      5. 4 mL or 4 L      6. 6 mL or 6 L

7. 400 mL or 400 L      8. 300 mL or 300 L      9. 325 mL or 325 L



## Try

- a. **Estimation** Would you use milliliters or liters to measure the amount of water a kitchen sink holds?

**Liters**

- b. **Estimation** Choose the more sensible measure for a flower vase.

2 mL 2 L  
**2 L**



**Practice Estimation** Would you use milliliters or liters to measure the amount of liquid each container holds?

- |                                     |                                       |                                      |
|-------------------------------------|---------------------------------------|--------------------------------------|
| 1. Ink bottle<br><b>Milliliters</b> | 2. Swimming pool<br><b>Liters</b>     | 3. Soup can<br><b>Milliliters</b>    |
| 4. Bathtub<br><b>Liters</b>         | 5. Drinking cup<br><b>Milliliters</b> | 6. Car fuel tank<br><b>Liters</b>    |
| 7. Washing machine<br><b>Liters</b> | 8. Teaspoon<br><b>Milliliters</b>     | 9. Baby bottle<br><b>Milliliters</b> |

**Estimation** Choose the more sensible measure.

- |  |  |   |
|--|--|---|
| 10. Fish tank<br>17 mL 17 L<br><b>17 L</b> | 11. Ice-cube tray<br>450 mL 450 L<br><b>450 mL</b> | 12. Spoon<br>5 mL 5 L<br><b>5 mL</b>      |
| 13. Bucket<br>8 mL 8 L<br><b>8 L</b>       | 14. Milk glass<br>250 mL 250 L<br><b>250 mL</b>    | 15. Mixing bowl<br>3 mL 3 L<br><b>3 L</b> |

**Apply** Solve each problem.

16. A bottle had 975 mL of medicine in it. Dr. Kato used 525 mL of the medicine. How much medicine is left in the bottle?  
**450 mL**
17. This month Dr. Kato has treated 28 horses. Last month she treated 37 horses. How many horses has Dr. Kato treated in the last two months?  
**65 horses**
18. An adult male horse has 40 teeth. An adult female horse has 4 fewer teeth than a male. How many teeth does an adult female horse have?  
**36 teeth**
19. **Find the facts.** Find a juice container that gives the amount of juice in milliliters. How many milliliters of juice does the container hold?  
**Answers will vary.**
20. **CALCULATOR** Dr. Kato was finding the total amount of one type of medicine. She added  $175 \text{ mL} + 335 \text{ mL} + 285 \text{ mL}$ . The display showed 813. The answer is incorrect. She pressed two keys out of order. What two keys did she press out of order?  
**She pressed 353 instead of 335.**

More Practice Set 38, page 365 101

## Assignment Guide

basic	1–16, 20
average	1–17, 20
enriched	1–20

**More Practice Set 38,**  
page 365

**Homework to do with others** With the help of another person, have each student estimate the length of four household items and record their lengths. Ask each student to have the other person help measure and record the actual lengths in centimeters or decimeters. Then tell students to discuss with the other person some techniques that might be used to make better estimates. Ask students to prepare a table showing this information and to bring the table to class.

## Follow-Up

**Extra Practice** Have students tell if the following would contain more or less than a liter of liquid: a picnic thermos [More], a lunchroom carton of milk [Less], a lake [More], a water fountain [More], a mug [Less], a perfume bottle [Less], and a washing machine [More].

**Reteaching** Have students make cards for their file boxes (Reteaching, page 97) that will show *capacity*. On the back of each card, students should write whether the object could best be measured in *liters* or *milliliters*.

**Enrichment** Have students write stories involving weight, length, and capacity, and use in the stories each of these vocabulary words: centimeter, decimeter, kilometer, meter, gram, kilogram, milliliter, and liter. Have them read the short stories to the class, omitting each metric unit and pausing. The listeners should jot down the appropriate measure.

## Daily Maintenance

Name the hundreds digit in each number.

- 463 [4]
- 37,056 [0]
- 5,871 [8]
- 628,950 [9]
- 2,649,173 [1]
- 4,725 [7]

## Enrichment 38

Name \_\_\_\_\_ E38

**Science Project I** **Answers will vary.**

You will need: a half-pint milk carton and a large glass jar

Make a mark 2 cm from the bottom of the milk carton. Cut away the top of the carton

Pour water up to the 2 cm mark. This is about 100 mL. Pour the 100 mL of water into the jar. Place a strip of tape on the jar and mark the level

Use your milk carton to help you mark these levels on the glass jar

1. 200 mL	2. 300 mL	3. 400 mL
4. 500 mL	5. 600 mL	6. 700 mL
7. 800 mL	8. 900 mL	9. 1,000 mL

Now use your jar to find the capacity in milliliters of each of the following

10. A can of tomato juice _____	11. A glass of milk _____
12. A teakettle of water _____	13. An ice cube tray _____
14. A cup of tea _____	15. A soup bowl _____

When the jar is filled to the 1,000 mL mark, it contains 1 liter. Find the capacity in liters of these larger containers

16. Large mixing bowl _____	17. Water pitcher _____
18. Paint can _____	19. Large coffee can _____
20. Bathroom sink _____	21. A bucket _____

## Additional Resource 38

Name \_\_\_\_\_ Additional Resource 38

**Project Make a Liter**

Materials needed: cardboard, centimeter ruler, pencil, scissors, tape, plastic bag, liter bottle, metric scale (if available)

Draw and cut out five cardboard squares that measure 10 centimeters on each side

Tape the five squares together to form an open box. Put some extra tape all around the box to make it stronger.

The box is 10 centimeters long, 10 centimeters wide, and 10 centimeters deep. When it is filled to the top, it holds 1 liter

Put the plastic bag into the box, making sure that the bag is large enough to go into the corners of the box, and to come over the edges at the top of the box.

Fill the liter bottle with water and carefully pour the water into your liter box. Now your box is holding 1 liter of water.

Use the metric scale to weigh your liter of water. How much does it weigh? (The liter of water should weigh about 1 kilogram)

You can use your liter box to measure other things, such as rice or sand.



## Practice

Mixed Practice for Objectives 35–38

### Materials

- Centimeter rulers (Teaching Aid G, Punchouts or Math Kit)

## Introduction

Review the metric units of length (centimeter, decimeter, meter, and kilometer), the metric units of weight (gram and kilogram), and the metric units of capacity (liter and milliliter). Be sure students are familiar with the symbols for each unit of measure.

**Motivational Situation** Suppose you invited a veterinarian to come talk to your class on career day. Make a list of questions that you want the veterinarian to answer. [What type of animals does he or she treat? How many animals does he or she see each day? What was the most unusual animal he or she ever treated?] If you decided you wanted to become a veterinarian what information would you need to know?

[Where do you go to school? How long does it take to become a veterinarian? Do you want to treat farm animals, zoo animals, or family pets?]

## Using the Pages

Discuss the relationship between metric units of measure. You may wish to begin a permanent chart, on the chalkboard or on poster board, showing 10 centimeters = 1 decimeter, 100 centimeters = 1 meter, 1,000 meters = 1 kilometer, 1,000 grams = 1 kilogram, and 1,000 milliliters = 1 liter.

Exercises 1–6 require measuring with centimeter rulers.



**Error Analysis** For Exercises 7–15, remind students that they are choosing the sensible measure for the size of actual objects, not the size of the objects as pictured.

**Apply Problem Solving** Read through the problem situation on page 103. For Problem 16, students may suggest that the class mark the length of one student's strides with chalk and then measure its length by the palm of Mr. Abel's hand (10 cm). Students can then multiply this length by the number of strides needed to cross the bridge. For Problem 17, students can measure the length of time it takes to cross the bridge. Then, when standard measuring tools become available, they can mark off how far a student can walk in that time.

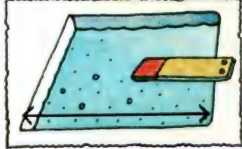
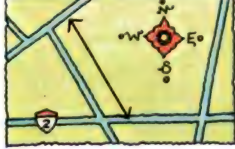
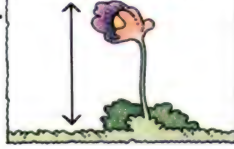
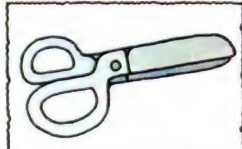


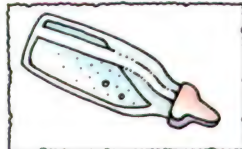


**Choosing a computation method** Read this problem to students and have (Continued on page 103.)

## Practice: Metric Measures

**Estimation** Estimate each length to the nearest centimeter. Then measure it.

- \_\_\_\_\_ 5 cm
- \_\_\_\_\_ 7 cm
- \_\_\_\_\_ 10 cm
- \_\_\_\_\_ 15 cm
-  2 cm
-  5 cm

**Estimation** Choose the more sensible measure.

-  30 m 30 km  
30 m
-  16 dm 16 km  
16 km
-  2 cm 2 dm  
2 dm
-  60 g 60 kg  
60 g
-  3 g 3 kg  
3 g
-  4 g 4 kg  
4 kg
-  200 mL 200 L  
200 mL
-  4 mL 4 L  
4 L
-  2 mL 2 L  
2 L

102

## Practice Game

### Words from Metric Words

**Number of players:** Teams of 3–4

### Rules

- Play the game for three rounds. For each round, write one of the following words on the chalkboard:

centimeters kilograms milliliters

- Within a time limit of five minutes, each member of the team writes as many words of two or more letters as he or she can, using the letters of the word on the chalkboard. Plurals of any words should not be used. Some sample answers appear on the next page.

- Team members compare lists, cross off duplicate words, and count the number of different words they have altogether.

- Play the game two more times, using the other two words.

**The Winner:** The team with the highest total of words is the winning team.

### Variations

The game can be played with key words from various chapters, for example, *numerators*, *denominators*, *multiplication*, *division*, *congruence*, *parallelogram*, and *pictographs*.



## MAINTENANCE

**Apply** Read through the problem situation given below. Then answer Problems 16–17.

Mr. Abel and his class are on a walking tour of their city. They come to an old bridge. Mr. Abel asks his students to measure the length of the bridge.

"How can we measure the bridge?" asks Sally. "We didn't bring any measuring tools."

"Yes we did," answers Billy. "We can use our feet. And I have a piece of chalk. Mr. Abel will let us borrow his watch that has a second hand."

Mr. Abel adds, "I know that the width across the palm of my hand is about 10 centimeters."

Doug says, "I can take little steps, putting the heel of one foot against the toe of the other. I can walk across the bridge that way."

Jane says, "That will take too much time. You should take the biggest steps that you can. But we need to know how long each step is. Or we can think of a way to measure using Mr. Abel's watch."

Work as a group to find out how to measure the bridge. Talk about these questions.

16. How can a piece of chalk help Mr. Abel's class measure the length of the bridge?

17. How can a watch with a second hand help the class to measure the bridge?

**See Using the Pages.**

Explain to your class how your group would measure the bridge. Discuss and compare your methods and solutions with other groups.

Tell what the 2 means in each number.

- |               |                    |
|---------------|--------------------|
| 1. 427        | 2. 285             |
| <b>2 tens</b> | <b>2 hundreds</b>  |
| 3. 902        | 4. 2,481           |
| <b>2 ones</b> | <b>2 thousands</b> |
| 5. 3,924      | 6. 3,206           |
| <b>2 tens</b> | <b>2 hundreds</b>  |

Add or subtract.

- |   |   |
|---|---|
| 7. $\begin{array}{r} 36 \\ + 23 \\ \hline 59 \end{array}$     | 8. $\begin{array}{r} 43 \\ + 52 \\ \hline 95 \end{array}$       |
| 9. $\begin{array}{r} 57 \\ + 35 \\ \hline 92 \end{array}$     | 10. $\begin{array}{r} 29 \\ + 31 \\ \hline 60 \end{array}$      |
| 11. $\begin{array}{r} 354 \\ + 287 \\ \hline 641 \end{array}$ | 12. $\begin{array}{r} 646 \\ + 589 \\ \hline 1,235 \end{array}$ |
| 13. $\begin{array}{r} 87 \\ - 45 \\ \hline 42 \end{array}$    | 14. $\begin{array}{r} 73 \\ - 48 \\ \hline 25 \end{array}$      |
| 15. $\begin{array}{r} 52 \\ - 27 \\ \hline 25 \end{array}$    | 16. $\begin{array}{r} 68 \\ - 46 \\ \hline 22 \end{array}$      |
| 17. $\begin{array}{r} 354 \\ - 287 \\ \hline 67 \end{array}$  | 18. $\begin{array}{r} 646 \\ - 589 \\ \hline 57 \end{array}$    |
| 19. $437 + 286 + 189$<br><b>912</b>                           |   |
| 20. $276 + 548 + 168$<br><b>992</b>                           |   |
| 21. $691 + 217 + 534$<br><b>1,442</b>                         |   |
| 22. $514 + 223 + 659$<br><b>1,396</b>                         |   |

Using Problem-Solving Strategies, page 416 **103**

## Assignment Guide

basic 1–17  
average 1–17  
enriched 1–17

(Continued from page 102.)

them choose whether to estimate or to compute an exact answer. Princess Pat, a spaniel, jumped 656 millimeters to catch a ball. Oscar, a terrier, jumped 539 millimeters to make a similar catch. How much higher was Princess Pat's jump than Oscar's jump? [117 mm]

### Maintenance, page 103

Have students give estimates of the sums for Exercises 19–22. For Exercise 19, for example, ask the students to find the sum of the digits in the hundreds place. [400 + 200 + 100 = 700] Then have them look at the numbers 37, 86, and 89. Point out to the students that both 86 and 89 are close to 100, so the sum of the three numbers must be about 200. Have the students add 200 to 700. The sum of the 3 numbers is about 900. Estimates for the remaining exercises may vary. Encourage students to suggest other ways of estimating the sum of 3 numbers.

### Follow-Up

If your students made the file boxes suggested in Reteaching on pages 97, 99, 101, you might want them to use the cards for additional drill. Have the students work in groups. Have one person in each group show his cards to the group one at a time, asking for the appropriate unit of measure. Repeat the activity until each student has had a chance to show the cards in his file box.

Have students play the game that is described below the lesson pages.

### Reading and Writing Mathematics

Write the following metric abbreviations on the board. Have each student write out the full word for each. cm [centimeter], km [kilometer], mL [milliliter], g [gram], dm [decimeter].

### Daily Maintenance

- \$0.98 – \$0.56 [\$0.42]
- \$1.74 – \$0.49 [\$1.25]
- \$8.83 – \$2.34 [\$6.49]
- \$9.22 – \$0.43 [\$8.79]
- \$36.19 – \$15.55 [\$20.64]
- \$29.94 – \$4.26 [\$25.68]

**Using Problem-Solving Strategies, page 416**

### Kilograms

### Centimeters

### Milliliters

ram	gram	cent	meter	mile	liter
rag	sail	meet	time	lilt	tile
log	rail	rim	trim	mire	smile
milk	oil	nice	mice	silt	sill
silk	oar	ice	mince	slit	miser
slim	aim	enter	center	till	melt
slam	girl	mitt	crime	mill	still
sag	gas	met	stem	stir	time
air	ask	rest	stir	mite	slim
soil	mask	rent	mist	stem	rest



## Objective 39

Solve problems by estimating distances.

### Lesson Theme

Reading: Fantasy

### Materials

- Centimeter rulers (Teaching Aid G, Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Have students choose the most sensible estimate for the following problems.

- The number of pages in their math book  
16 43 350 [350]
- The age of a fourth grader  
10 36 90 [10]
- The number of books in their classroom  
7 25 200 [200]

## Using the Pages

**Teach** After students have read the problem, make sure each student can locate each point on the map. Ask students the following questions. What is the distance from the landing to the pond? [10 km] What other distance is given on the map? [The distance from the quicksand to the buried treasure] Is the distance from the cave to the buried treasure greater or less than the distance from the quicksand to the buried treasure? [Less] Is the distance from the cave to the buried treasure greater than or less than the distance from the landing to the pond? [Less] Have the students examine the three choices for answers. Have students explain why 7 km is the only sensible estimate. [The distance from the cave to the buried treasure is less than 10 km and 7 km is the only choice less than 10 km.]

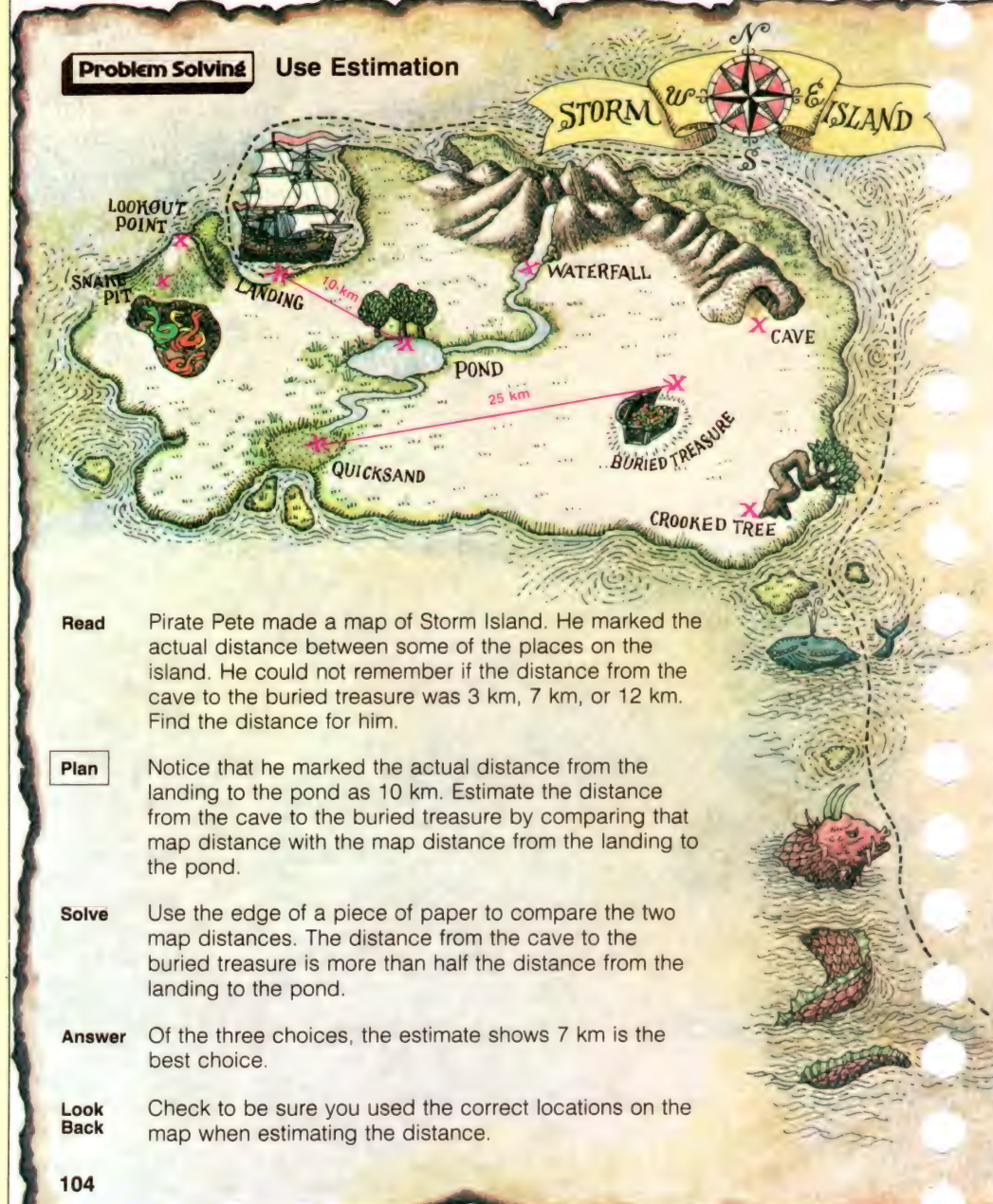
**Try Error Analysis** Watch for students who do not use the information they already have as a basis for their estimate. Remind students to compare the distance they are to estimate with a distance that they already know. (See Reteaching 39.)

**Apply Problem Solving** Explain that a sensible estimate is one that will fit with the information given.

**Use logical reasoning** In Problem 8, the distance from the waterfall to the buried treasure is greater than the distance from the landing to the pond (10 km) and less than the distance from the quicksand to the buried treasure (25 km). Since 13 km is the only choice between 10 and 25, it must be the correct answer.

### Problem Solving

### Use Estimation



**Read** Pirate Pete made a map of Storm Island. He marked the actual distance between some of the places on the island. He could not remember if the distance from the cave to the buried treasure was 3 km, 7 km, or 12 km. Find the distance for him.

**Plan** Notice that he marked the actual distance from the landing to the pond as 10 km. Estimate the distance from the cave to the buried treasure by comparing that map distance with the map distance from the landing to the pond.

**Solve** Use the edge of a piece of paper to compare the two map distances. The distance from the cave to the buried treasure is more than half the distance from the landing to the pond.

**Answer** Of the three choices, the estimate shows 7 km is the best choice.

**Look Back** Check to be sure you used the correct locations on the map when estimating the distance.

104

## Practice 39

Name \_\_\_\_\_

**P39**

Solve each problem. Circle the most sensible estimate for the straight line distance.

- from point A to point D  
18 yd. 20 yd. 30 yd.
- from point A to point C  
4 yd. 12 yd. 20 yd.
- from point E to point F  
15 yd. 20 yd. 25 yd.
- from point D to point E  
15 yd. 30 yd. 40 yd.
- from point B to point F  
18 yd. 20 yd. 31 yd.
- from point G to point P  
3 yd. 12 yd. 18 yd.
- from point G to point C  
18 yd. 30 yd. 33 yd.
- from point T to point P  
4 yd. 12 yd. 16 yd.
- from point T to point G  
5 yd. 17 yd. 25 yd.
- from point B to point P  
7 yd. 11 yd. 15 yd.
- from point X to point E  
15 yd. 25 yd. 45 yd.
- from point D to point T  
12 yd. 22 yd. 32 yd.

## Reteaching 39

Name \_\_\_\_\_

**R39**

On the map of Cat Island, the distance from Port Alley to Leopardville is about 40 km. Use this distance to help you with the questions below.

Circle the most sensible distance between each two towns.

1. Siamese City and Lion Lookout	15 km	<u>40 km</u>	80 km
2. Tiger City and Leopardville	10 km	25 km	<u>50 km</u>
3. Siamese City and Leopardville	<u>45 km</u>	75 km	90 km
4. Port Alley and Lion Lookout	30 km	45 km	<u>80 km</u>
5. Port Alley and Persian Village	40 km	<u>80 km</u>	120 km
6. Tiger City and Lion Lookout	50 km	<u>130 km</u>	300 km
7. Siamese City and Tiger City	<u>90 km</u>	120 km	150 km
8. Persian Village and Leopardville	50 km	<u>90 km</u>	150 km
9. Port Alley and Siamese City	30 km	50 km	<u>80 km</u>
10. Tiger City and Port Alley	<u>85 km</u>	125 km	500 km



## Assignment Guide

basic	1-5
average	1-7
enriched	1-8

**More Practice Set 39,**  
**page 365**

## Follow-Up

**Extra Practice** Have students choose the most sensible estimate for the actual distance from

- Lookout Point to the landing.  
7 km 12 km 20 km [7 km]
- pond to quicksand.  
8 km 18 km 28 km [8 km]
- waterfall to cave.  
2 km 16 km 42 km [16 km]
- snake pit to quicksand.  
5 km 15 km 45 km [15 km]

**Reteaching** Encourage students to find the most sensible estimate for each problem by eliminating the choices that are not sensible. Explain that 20 km is not a sensible estimate for the distance from the cave to the buried treasure because that distance is less than half the distance from the quicksand to the buried treasure. Also, 10 km is not a sensible estimate because the distance from the cave to the buried treasure is less than the distance from the landing to the pond. Therefore, the only sensible estimate is 7 km.

**Enrichment** Have students try to give reasonable estimates for actual distances, using an actual road map with a scale.

## Cooperative Learning Groups

See page 477 of this Teacher's Edition.

**Try Estimation** Solve each problem. Use the map on page 104.

- Is the actual distance from the lookout point to the quicksand less than or greater than the actual distance from the landing to the pond?  
**Greater than**
- Choose the most sensible estimate for the actual distance from the lookout point to the quicksand.  
5 km 10 km 17 km  
**17 km**

**Apply Estimation** Solve each problem. Use the map on page 104.

- Is the actual distance from the lookout point to the snake pit less than or greater than the actual distance from the landing to the pond?  
**Less than**
- Is the actual distance from the cave to the crooked tree less than or greater than the actual distance from the landing to the pond?  
**Greater than**
- Choose the most sensible estimate for the actual distance from the lookout point to the snake pit.  
3 km 10 km 15 km  
**3 km**
- Choose the most sensible estimate for the actual distance from the cave to the crooked tree.  
4 km 10 km 13 km  
**13 km**

Look at the map. Notice that the actual distance from the quicksand to the buried treasure is 25 km. Choose the most sensible estimate for the actual distance from the

- landing to the waterfall.  
17 km 25 km 30 km  
**17 km**
- pond to the waterfall.  
3 km 10 km 25 km  
**10 km**
- quicksand to the crooked tree.  
9 km 25 km 30 km  
**30 km**
- waterfall to the buried treasure.  
7 km 13 km 30 km  
**13 km**



More Practice Set 39, page 365 105

## Enrichment 39

Name \_\_\_\_\_

**This Big Rabbit Came In Through The Window...** E39

Some ink was dripped on this page of problems. Part of the information is blotted out. For each problem, circle the answer that you think is correct.

- Bill's height is \_\_\_\_\_ m. Joe's is 15'. What is the difference in their heights?  
22 m    **22 cm**    22 km    **8 m**    1 m    80 m
- Danese read that one of the longest bicycles ever built could seat 10 people. Its length was \_\_\_\_\_.  
98 cm    150 cm    45 cm    **30 g**    1 kg    227 g
- Meg measured the distance from the floor to the doorknob. The distance was \_\_\_\_\_.  
26 m    12 cm    **76 cm**    11 cm    4 cm    67 cm
- Jan has 7 video-game cartridges. Each one is \_\_\_\_\_ thick. When they are all stacked together, how tall is the stack of cartridges?  
20 cm    **140 cm**    228 cm    **2 km**    20 km    75 cm
- Bill laid a dozen eggs end to end. The length of the smallest egg was \_\_\_\_\_ and the length of the largest egg was \_\_\_\_\_. How long was the line of eggs?  
20 cm    **140 cm**    228 cm    **2 km**    20 km    75 cm
- Tom ran \_\_\_\_\_ . Judy ran 3 times as far. How far did Tom run?  
20 cm    **140 cm**    228 cm    **2 km**    20 km    75 cm

## Additional Resource 39

Name \_\_\_\_\_

**Maintenance** Additional Resource 39

Add

- $\begin{array}{r} 65 \\ + 9 \\ \hline 74 \end{array}$
- $\begin{array}{r} 83 \\ + 115 \\ \hline 198 \end{array}$
- $\begin{array}{r} 35 \\ + 47 \\ \hline 82 \end{array}$
- $\begin{array}{r} 74 \\ + 28 \\ \hline 102 \end{array}$
- $\begin{array}{r} 153 \\ + 89 \\ \hline 242 \end{array}$
- $\begin{array}{r} 453 \\ + 1387 \\ \hline 1,840 \end{array}$
- $\begin{array}{r} 503 \\ + 468 \\ \hline 971 \end{array}$
- $\begin{array}{r} 757 \\ + 143 \\ \hline 900 \end{array}$
- $\begin{array}{r} 5,489 \\ + 537 \\ \hline 6,026 \end{array}$
- $\begin{array}{r} 6,017 \\ + 2,998 \\ \hline 9,015 \end{array}$
- $\begin{array}{r} 5,607 \\ + 153 \\ \hline 5,760 \end{array}$
- $\begin{array}{r} 9,154 \\ + 758 \\ \hline 9,912 \end{array}$
- $\begin{array}{r} 65 \\ 146 \\ 39 \\ 33 \\ + 71 \\ \hline 315 \end{array}$
- $\begin{array}{r} 9 \\ 39 \\ 53 \\ + 427 \\ \hline 528 \end{array}$
- $\begin{array}{r} 5,421 \\ 75 \\ 106 \\ + 1,053 \\ \hline 6,655 \end{array}$
- $\begin{array}{r} 1,235 \\ 82 \\ 310 \\ + 6456 \\ \hline 8,083 \end{array}$

Use the information in the table to help you solve each problem.

- What is the total weight of a gorilla and two chimpanzees?  
**750 pounds**
- Which two animals have a total weight of 1,100 pounds?  
**horse and chimpanzee**

Animal	Weight
Chimpanzee	150 pounds
Gorilla	450 pounds
Horse	950 pounds
Crocodile	1,100 pounds

## Daily Maintenance

For each number, tell what digit is in the given place.

- 5,126 (tens) [2]
- 2,084 (hundreds) [0]
- 9,235 (thousands) [9]
- 5,063 (ones) [3]
- 4,316 (thousands) [4]
- 1,728 (hundreds) [7]



## Objective 40

Measure objects to the nearest inch and choose the appropriate measure of length using inch or foot.

### Lesson Theme

Health: Food

### Vocabulary

Foot, inch

### Materials

- Inch rulers (Teaching Aid F, Punchouts or Math Kit)
- Tape measure (Math Kit)

## Introduction

**Using Concrete Materials** Provide a list of ten measurements in feet or inches. Ask students to find objects from a particular category with these measurements. For example, the objects might all be writing utensils, sewing notions, sports equipment, and so on.

Review again the metric units of measure. Then tell students that two systems of measurement are used in the United States; the metric system they have just studied and the customary system that they will study next.

## Using the Pages

### Teach Reading and Writing Mathematics

Explain that *inch* and *foot* are units of measure in the customary system used to measure length. Ask students to suggest body measurements that would be about one inch [The distance from the end of their thumbs to the first knuckle, the length of a toe, the width of an eye] or one foot [Height to the knee, the width from tip of little finger to tip of little finger of two hands spread, the length of a normal step].

**Try** Emphasize that abbreviations for customary units of measure are written with a period.

**Practice Error Analysis** Watch for students who align the start of a segment they are measuring with the 1-mark on the ruler instead of the 0-mark. Have these students demonstrate the paper placement of the ruler by measuring several different objects.

**Apply Problem Solving** For Problems 9 and 10, ask a student to describe the thought processes as he or she solves the problem. When the first student is finished, ask if any students thought about the problem differently. Encourage students to share their problem-solving techniques.

## Inch and Foot

The *inch* and *foot* are customary units for measuring length.

**A.** The width of each slice of the sandwich shown below is about one inch (1 in.).

**B.** The length of the whole sandwich is about one foot (1 ft.).  
1 ft. = 12 in.

**Try Estimation** Estimate each length to the nearest inch. Then measure it.

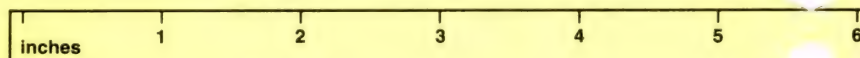
**a.** \_\_\_\_\_  
3 in.

**b.** \_\_\_\_\_  
2 in.

**Estimation** Tell if each measure is sensible. Write *yes* or *no*.

**c.** A pencil is about 8 feet long.  
No

**d.** Your thumb is about 2 inches long.  
Yes



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## Practice 40

Name \_\_\_\_\_ P40

Estimate the length of each pencil to the nearest inch. Then measure it.

1. 5 inches

2. 2 inches

3. 3 inches

4. 4 inches

Tell if each measure is sensible. Write *yes* or *no*.

5. The length of a kitchen table is about 5 feet. Yes \_\_\_\_\_ No \_\_\_\_\_

6. The length of a postage stamp is about 1 foot. Yes \_\_\_\_\_ No \_\_\_\_\_

7. A toaster is about 7 inches tall. Yes \_\_\_\_\_ No \_\_\_\_\_

8. A TV screen is about 18 inches high. Yes \_\_\_\_\_ No \_\_\_\_\_

9. The height of a ladder is about 15 inches. Yes \_\_\_\_\_ No \_\_\_\_\_

10. The length of a paintbrush is about 9 feet. Yes \_\_\_\_\_ No \_\_\_\_\_

11. A squirrel is about 18 feet long. Yes \_\_\_\_\_ No \_\_\_\_\_

12. The length of a teaspoon is about 8 inches. Yes \_\_\_\_\_ No \_\_\_\_\_

## Reteaching 40

Name \_\_\_\_\_ R40

The *inch* (in.) and the *foot* (ft.) are customary units for measuring length.

A stamp is about one inch long. A notebook is about one foot long.

1 in. = 12 in.

Circle the more sensible answer.

1. 3 in. 3 ft.

2. 6 in. 6 ft.

3. 1 in. 1 ft.

4. 20 in. 20 ft.

5. 3 in. 3 ft.

6. 16 in. 16 ft.

7. 10 in. 10 ft.

8. 20 in. 20 ft.

9. 1 in. 1 ft.





**Practice Estimation** Estimate each length to the nearest inch. Then measure it.

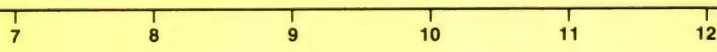
1. \_\_\_\_\_ 1 in.
2. \_\_\_\_\_ 4 in.
3. \_\_\_\_\_ 6 in.
4. \_\_\_\_\_ 5 in.

**Estimation** Tell if each measure is sensible. Write yes or no.

5. Your shoe is about 6 inches long. **Yes**
6. A student is about 9 feet tall. **No**
7. A telephone pole is about 20 inches tall. **No**
8. A tennis racket is about 2 feet long. **Yes**

**Apply** Solve each problem.

9. Diego made a party sandwich 32 inches long. He and his guests ate 26 inches of it. How much of the sandwich was left?  
**6 in.**
10. Diego hung streamers for a party. He used 35 feet of red paper, 27 feet of blue paper, and 21 feet of white paper. How many feet of paper did he use?  
**83 ft.**



More Practice Set 40, page 366 107

## Assignment Guide

basic 1-9  
average 1-10  
enriched 1-10

**More Practice Set 40,**  
**page 366**

## Follow-Up

**Extra Practice** Have the students make up a paper as shown below, and fill it in for five objects they measure in the classroom.

Object	Unit of measure	Estimate	Actual measure

**Enrichment** Have the students measure the distance around several objects using a piece of string held snugly around the object and then laying the open string on a ruler or tape measure to measure. They can measure their desk tops, wrists, ankles, aluminum cans, flower pots, or any classroom object.

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic, and then give reasons for their choices.

1.  $320 - 240$  [80]
2.  $4,812 - 1,290$  [3,522]
3.  $3,075 + 602 + 97$  [3,774]
4.  $810 + 430$  [1,240]
5.  $26 + 34 + 30$  [90]
6.  $67 - 43$  [24]

## Enrichment 40

Name \_\_\_\_\_ E40

**Which Pieces Make the Number of Feet I Need?**

In each section, find lengths in the list that add up to the length given in each exercise. Write them above the line as shown in the first exercise. Many can be done in more than one way. **Answers will vary.**

**I**

17 in. 1.  $\begin{array}{r} 17 \text{ in.} \\ 3 \text{ in.} \\ + 4 \text{ in.} \\ \hline 24 \text{ in.} = 2 \text{ ft.} \end{array}$

6 in.  $\begin{array}{r} 4 \text{ in.} \\ 2 \text{ in.} \\ + 6 \text{ in.} \\ \hline 12 \text{ in.} = 1 \text{ ft.} \end{array}$

30 in.  $\begin{array}{r} 30 \text{ in.} \\ + 6 \text{ in.} \\ \hline 36 \text{ in.} = 3 \text{ ft.} \end{array}$

**II**

10 in. 4.  $\begin{array}{r} 16 \text{ in.} \\ 5 \text{ in.} \\ + 3 \text{ in.} \\ \hline 24 \text{ in.} = 2 \text{ ft.} \end{array}$

6 in.  $\begin{array}{r} 6 \text{ in.} \\ 1 \text{ in.} \\ + 5 \text{ in.} \\ \hline 12 \text{ in.} = 1 \text{ ft.} \end{array}$

3 in. 6.  $\begin{array}{r} 10 \text{ in.} \\ 23 \text{ in.} \\ + 3 \text{ in.} \\ \hline 36 \text{ in.} = 3 \text{ ft.} \end{array}$

## Additional Resource 40

Name \_\_\_\_\_ Additional Resource 40

**Computer BASIC: Addition and Subtraction**

Turn on your computer.  
Type each of these statements.  
Press RETURN or ENTER. Write your outputs.

1. PRINT "78-341"  
**78-341**

3. PRINT "580-269"  
**580-269**

2. PRINT 78+341  
**419**

4. PRINT 580-269  
**311**

The computer copies problems in quotation marks.  
The computer prints answers for problems that are not in quotation marks.

Draw a line from the statement to its output.  
Type each line and press RETURN or ENTER to check your answers.

912-543

9740

6717

5. PRINT "8813+3927"  
**8813+3927**

6. PRINT 7402-686  
**6716**

7. PRINT 894-607+47  
**334**

8. PRINT 912-543  
**369**

9. PRINT "912-543"  
**369**

10. PRINT 8813+3927  
**12740**

Write what you think the output will be when you run the program below. Check your answer on the computer.

11. 10 PRINT "6870+5214"  
20 PRINT 6870+5214  
30 PRINT "741-90"  
40 PRINT 741-90  
50 END

**6870+5214**  
**12084**  
**741-90**  
**651**

## Daily Maintenance

Write an equation. Then give the answer.

1. At the library 421 books were checked out in the morning, 128 books in the afternoon, and 76 books in the evening. How many books were checked out that day? [ $421 + 128 + 76 = n$  625 books]
2. Sandy read a book with 343 pages. She read another book with 254 pages. How much longer was the first book? [ $343 - 254 = n$  89 pages]
3. There were 37 monthly magazines and 12 weekly magazines in the library. How many magazines were there in all? [ $37 + 12 = n$  49 magazines]



## Objective 41

Choose an appropriate measure of length using inch, foot, yard, or mile.

### Lesson Theme

Recreation: Golf

### Vocabulary

Mile, yard

### Materials

- Inch rulers (Teaching Aid F, Punchouts, or Math Kit)
- Tape measure (Math Kit)
- Yardstick

## Introduction

Explain that there are other measures of length to use when measuring distances greater than three feet. Ask students if they know what these might be. [Yard, mile]

**Using Concrete Materials** Have one group of students measure the length of the classroom in inches, then in feet, and finally, in yards. Have another group of students measure the width of the classroom in the same manner. Ask students questions such as: "Are there more inches or feet in the length of the room?", [Inches] "Are there more feet or yards in the width of the room?", [Feet] "Are there more inches or yards in the length of the room?" [Inches] Explain that the larger the unit of measurement, the fewer the number of units needed to measure a length.

## Using the Pages

**Teach** Point out the number of feet in a yard and the number of yards in a mile. Have students give examples of ways they might use yards [to measure fabric or length of a football field] and miles [distance a student jogs, walks, or rides a bicycle].

**Try** Have students explain why *miles* is the most sensible unit of measure in Exercise a.

**Practice** Be sure to accept any answers a student can reasonably defend.

**Error Analysis** Some students may find it easier to choose a sensible measure when they can see a pictured object such as those shown. (See **Reteaching 41**.)

**Apply Problem Solving** In Problems 15 and 16, ask the students if the answer will be greater than or less than the greatest number in the problem.

## Yard and Mile



Other customary units of length are the **yard** and the **mile**. These are useful for measuring longer distances.

- a. The length of a golf club is about one yard (1 yd.).  
1 yd. = 3 ft.

- b. It would take 1,760 golf clubs laid end to end to measure about one mile (1 mi.).  
1 mi. = 1,760 yd.

### Try

- a. **Estimation** Would you use inches, feet, yards, or miles to measure the distance from the earth to the sun?

**Miles**

- b. **Estimation** Choose the most sensible measure for the height of a room.

3 in.    3 yd.    3 mi.  
**3 yd.**

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## Practice 41

Name \_\_\_\_\_

Circle the unit you would use for each measure.

1. Yards or miles

2. Yards or miles

3. Yards or miles

What do all of us do at the same time?

To find out, circle the more sensible measure in each exercise. Shade each box below that contains an answer. Write the letters in the shaded boxes in order on the blanks.

4. Length of a kitten  
12 in. 12 ft. 12 yd.

5. Height of a door  
7 ft. 7 yd. 7 mi.

6. Height of a mature tree  
9 in. 9 ft. 9 yd.

7. Length of a desk  
4 in. 4 ft. 4 yd.

8. Height of a glass  
5 in. 5 ft. 5 yd.

9. Length of a lake  
3 ft. 3 yd. 3 mi.

A	O	G	L	R	I	O	D
12 ft	12 in	3 ft	7 ft	8 in	6 yd	3 yd	9 yd
G	E	S	T	P	D	R	I
4 yd	4 ft	6 mi	4 mi	7 in	9 mi	5 in	3 mi

GROW O L D E R I

## Reteaching 41

Name \_\_\_\_\_

The yard (yd.) and the mile (mi.) are customary units for measuring length.

The width of a door is about one yard.  
1 yd. = 3 ft.

8 city blocks measure about one mile.  
1 mi. = 5,280 ft.

Circle the most sensible measure.

1. 2 in. 2 ft. 2 yd.

2. 15 in. 15 ft. 15 mi.

3. 3 ft. 3 yd. 3 mi.

4. 15 in. 15 ft. 15 yd.

5. 100 in. 100 ft. 100 mi.

6. 2 ft. 2 yd. 2 mi.

7. 20 in. 20 yd. 20 mi.

8. 3 ft. 3 yd. 3 mi.

9. 20 in. 20 ft. 20 yd.



## Assignment Guide

basic	1–15
average	1–15
enriched	1–16

**More Practice Set 41,**  
page 366

**Homework to do with others** Have students count the number of steps it takes each of several persons (including the student) to walk a particular distance, like the length of a corridor. Tell students to discuss their findings with another person, and propose how the height of the people affects the number of steps taken. Have each student report briefly on his or her findings.

## Follow-Up

**Reteaching** Have students make up cards for a measurement file box. These cards should be kept separate from the cards made for the metric system. Students should cut out pictures of objects from newspapers and magazines and paste them on 3 x 5 cards. On the front of each card they should write which type of measurement this card will be used for. In this case, *length* would be the appropriate word. On the back of each card, students should write whether the object could best be measured in *inches*, *feet*, *yards*, or *miles*. These cards can be used for future reference or for drill.

**Enrichment** The students may enjoy researching the origins of customary units of measurement. Have them prepare reports with illustrations to be presented orally in class and displayed on a bulletin board.

**Practice Estimation** Which unit would you use to measure the

- height of a desk?  
(inches or miles)  
**Inches**
- height of a flagpole?  
(feet or miles)  
**Feet**
- distance to the South Pole?  
(yards or miles)  
**Miles**
- distance between bus stops?  
(feet or miles)  
**Miles**
- distance run in a race?  
(inches or yards)  
**Yards**
- width of a TV screen?  
(inches or yards)  
**Inches**

**Estimation** Choose the most sensible measure.

- Length of a football  
12 in. 12 ft. 12 yd.  
**12 in.**
- Height of a chalkboard  
3 in. 3 ft. 3 mi.  
**3 ft.**
- Length of a bike path  
8 ft. 8 yd. 8 mi.  
**8 mi.**
- Width of a book  
8 in. 8 ft. 8 yd.  
**8 in.**
- Distance to first base  
90 in. 90 ft. 90 mi.  
**90 ft.**
- Length of the Delaware River  
390 in. 390 ft. 390 mi.  
**390 mi.**
- Height of a man  
2 ft. 2 yd. 2 mi.  
**2 yd.**
- Length of a car  
5 in. 5 yd. 5 mi.  
**5 yd.**

**Apply** Solve each problem.

- The first nine holes of one golf course are 2,845 yards. The last nine holes are 2,408 yards. How long is the entire course?  
**5,253 yd.**
- The first hole is 311 yards. The second hole is 374 yards. How much longer is the second hole than the first hole?  
**63 yd.**

More Practice Set 41, page 366 109

## Enrichment 41

Name \_\_\_\_\_ E41

**Catch Me if You Can!**

It would take about 20 minutes to walk 1 mile, and about 10 minutes to bicycle 1 mile.

Use the above information to complete the table.

Miles	1	2	3	5	6	10	8
Minutes Walking	20	40	60	100	200	400	400
Minutes Riding	10	20	30	50	100	200	

Refer to the table, and use the fact that 2 mile = 880 yards to answer the following questions.

- How many yards can be covered in a 10-minute walk?  
**880 yards**
- How many yards can be covered in a 15-minute bicycle ride?  
**2,640 yards**
- How many yards could be covered by riding a bicycle for 5 minutes, then walking 10 more minutes?  
**1,760 yards**

*(Illustration of a person walking and a person on a bicycle)*

## Additional Resource 41

Name \_\_\_\_\_ Additional Resource 41

**Maintenance**

Subtract

- $\begin{array}{r} 56 \\ -9 \\ \hline 47 \end{array}$
- $\begin{array}{r} 84 \\ -23 \\ \hline 61 \end{array}$
- $\begin{array}{r} 63 \\ -27 \\ \hline 36 \end{array}$
- $\begin{array}{r} 135 \\ -87 \\ \hline 48 \end{array}$
- $\begin{array}{r} 605 \\ -254 \\ \hline 351 \end{array}$
- $\begin{array}{r} 803 \\ -159 \\ \hline 644 \end{array}$
- $\begin{array}{r} 1852 \\ -659 \\ \hline 1,193 \end{array}$
- $\begin{array}{r} 3352 \\ -1547 \\ \hline 1,805 \end{array}$
- $\begin{array}{r} 7000 \\ -467 \\ \hline 6,533 \end{array}$
- $\begin{array}{r} 6427 \\ -4509 \\ \hline 1,918 \end{array}$
- $\begin{array}{r} 8432 \\ -2735 \\ \hline 5,697 \end{array}$
- $\begin{array}{r} 2407 \\ -1090 \\ \hline 1,317 \end{array}$
- $\begin{array}{r} 5000 \\ -582 \\ \hline 4,418 \end{array}$
- $\begin{array}{r} 7538 \\ -3519 \\ \hline 4,019 \end{array}$
- $\begin{array}{r} 9543 \\ -3375 \\ \hline 6,168 \end{array}$
- $\begin{array}{r} 3508 \\ -2180 \\ \hline 1,328 \end{array}$

Solve each problem.

- Fairview School has 973 students. Central School has 680 students. How many more students does Fairview School have than Central School?  
**293 students**
- Dunbar School has 235 fewer students than Central School. How many students does Dunbar School have?  
**445 students**

## Daily Maintenance

Tell if the measure is sensible. Write yes or no.

- A paper clip is about 3 dm long. [No]
- A key is about 5 cm long. [Yes]
- A crayon is about 7 cm long. [Yes]
- A pencil is about 1 dm long. [Yes]
- A pair of scissors is about 15 dm long. [No]



## Objective 42

Choose an appropriate measure of weight using ounce, pound, or ton.

### Lesson Theme

Consumer Topics: School Lunches

### Vocabulary

Ounce, pound, ton

### Materials

- Ounce and pound weights (Math Kit)
- Balance (Math Kit)

## Introduction

Review the customary units of length (inch, foot, yard, mile). Tell students that in this lesson they will be learning about customary units of weight.

**Using Concrete Materials** Select several small classroom objects to weigh. Choose students to weigh objects, using a balance and ounce and pound weights. Ask other students to record the measurements on the chalkboard and then order the objects from lightest to heaviest.

## Using the Pages

**Teach** Read and discuss the examples. Ask for other ways students might use customary units of weight. [Weigh food, people, packages to be mailed] For fun, ask students which weighs more—a ton of feathers or a ton of bricks. [Neither—they both weigh a ton.]

**Try** In Exercise a, students should choose the most sensible unit of measure for finding the weight of a fourth-grade student.

**Practice** Before you assign the exercises, have the students name the appropriate unit of weight for objects similar to those listed on the page.

### Apply Problem Solving

**Choosing a computation method** You might want to discuss Problems 16–20 orally in class since all of them can be solved mentally. Have students explain how they plan to solve Problem 20 before they begin. Encourage students to explain why they chose the method they did.

**Give sensible answers** Have students check the reasonableness of their answers. Point out to them that in Problem 18, for example, a hamburger costs more than a spaghetti lunch, so a hamburger must cost more than 65¢.

## Ounce, Pound, and Ton

The cook at the school cafeteria uses ground beef in many school lunches.

- The lunch menu often includes meatballs. A meatball weighs about one **ounce** (1 oz.).
- Sometimes, the cook prepares hamburgers. Four hamburgers weigh about one **pound** (1 lb.).  
 $1 \text{ lb.} = 16 \text{ oz.}$
- The **ton** is used to measure very large weights. From one ton of ground beef, the cook could make about 8,000 hamburgers or 32,000 meatballs.  
 $1 \text{ ton} = 2,000 \text{ pounds}$



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## Practice 42

Name \_\_\_\_\_

Would you use ounces, pounds, or tons to measure the weight of

1. a pencil?	<u>Ounces</u>	2. a pumpkin?	<u>Pounds</u>
3. a turkey?	<u>Pounds</u>	4. a bulldozer?	<u>Tons</u>
5. a greeting card?	<u>Ounces</u>	6. a cat?	<u>Pounds</u>
7. a ferris wheel?	<u>Tons</u>	8. an apple?	<u>Ounces</u>


Circle the most sensible measure.

9. Television set 18 ounces 18 pounds 18 tons	10. Bowling ball 8 ounces 8 pounds 8 tons
11. School book 12 ounces 12 pounds 12 tons	12. Tractor 2 ounces 2 pounds 2 tons

Solve each problem.

13. Ellen bought 32 ounces of yarn to make potholders. 7 ounces of yarn were left over. How many ounces of yarn did she use for the potholders?  
25 ounces of yarn

14. A small yarn hook costs 45¢. A larger hook costs 33¢ more. How much does the larger hook cost?  
78¢



## Reteaching 42

Name \_\_\_\_\_













The ounce (oz.), the pound (lb.), and the ton (T), are customary units for measuring weight.

Half of a small apple weighs about one ounce.

A small melon weighs about one pound.  
 $1 \text{ lb.} = 16 \text{ oz.}$

A compact car weighs about one ton.  
 $1 \text{ T} = 2,000 \text{ lb.}$

Circle the most sensible measure.

1.  4 oz 4 lb 4 T	2.  8 oz 8 lb 8 T	3.  2 oz 2 lb 2 T
4.  5 oz 5 lb 5 T	5.  7 oz 7 lb 7 T	6.  3 oz 3 lb 3 T
7.  2 oz 2 lb 2 T	8.  3 oz 3 lb 3 T	9.  8 oz 8 lb 8 T
10.  3 oz 3 lb 3 T	11.  2 oz 2 lb 2 T	12.  5 oz 5 lb 5 T



## Assignment Guide

basic	1–20
average	1–20
enriched	1–20

**More Practice Set 42,**  
page 366

## Follow-Up

**Reteaching** Have students make cards for their file boxes (Reteaching, page 109) that will show weight. On the back of each card, students should write whether the object could best be measured in *ounces*, *pounds*, or *tons*.

**Enrichment** In each of the following exercises, have students tell whether the total weight is more or less than a ton. They can either use repeated addition or multiplication.

- 4 gorillas, each weighing 550 lb. [More (2,200 lb.)]
- 8 people, each weighing 120 lb. [Less (960 lb.)]
- 7 boulders, each weighing 300 lb. [More (2,100 lb.)]
- 9 truckloads of dirt, each truckload weighing 200 lb. [Less (1,800 lb.)]

## Try

- a. **Estimation** Would you use ounces, pounds, or tons to measure the weight of a fourth-grade student?  
**Pounds**

- b. **Estimation** Choose the most sensible measure for the weight of a delivery truck.  
3 ounces    3 pounds    3 tons  
**3 tons**



Estimation

**Practice Estimation** Would you use ounces, pounds, or tons to measure the weight of

- |   |                                 |                                      |
|---|---------------------------------|--------------------------------------|
| 1. a hand-held calculator?<br><b>Ounces</b> | 2. an airplane?<br><b>Tons</b>  | 3. a chimpanzee?<br><b>Pounds</b>    |
| 4. a sandwich?<br><b>Ounces</b>             | 5. an orange?<br><b>Ounces</b>  | 6. a kitchen table?<br><b>Pounds</b> |
| 7. a tent?<br><b>Pounds</b>                 | 8. a locomotive?<br><b>Tons</b> | 9. a rocket?<br><b>Tons</b>          |

**Estimation** Choose the most sensible measure.

- |   |   |
|---|---|
| 10. Guitar<br>8 ounces    8 pounds    8 tons<br><b>8 pounds</b> | 11. Egg<br>2 ounces    2 pounds    2 tons<br><b>2 ounces</b>            |
| 12. Elephant<br>6 ounces    6 pounds    6 tons<br><b>6 tons</b> | 13. Ship<br>35 ounces    35 pounds    35 tons<br><b>35 tons</b>         |
| 14. Watch<br>8 ounces    8 pounds    8 tons<br><b>8 ounces</b>  | 15. Typewriter<br>20 ounces    20 pounds    20 tons<br><b>20 pounds</b> |

**Apply Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.

- A cook's helper used 17 pounds of apples from a 50-pound sack. Are there more or less than 30 pounds of apples left?  
**More; E**
- A spaghetti lunch costs 65¢. A hamburger costs 10¢ more. How much does a hamburger cost?  
**75¢; M**
- The cook was born in October of 1959. How many months old is the cook today?  
**Answers will vary; P, C**
- A cook used 45 pounds of pork and 60 pounds of beef in chop suey. How many pounds of meat did the cook use?  
**105 pounds; M, P**
- The cook prepared 15 pounds of hamburgers and 3 fewer pounds of meatballs. How many pounds of meatballs did the cook prepare?  
**12 pounds; M**

Using Problem-Solving Strategies, page 417  
More Practice Set 42, page 366 **111**

## Enrichment 42

Name \_\_\_\_\_ E42

**Cross-Number Puzzle III**

Fill the blanks in the following statements to help you complete the cross-number puzzle.

**Across**

- 3,213 lb. + 787 lb. = 2 T.
- 1 T. - 1,800 lb. = 200 lb.
- 3 lb. - 9 oz. = 39 oz.
- 425 lb. + 1,575 lb. = 1 T.
- 2 oz. + 13 lb. = 210 oz.
- $\frac{1}{2}$  T. - 225 lb. = 775 lb.
- 4 lb. - 4 oz. = 60 oz.
- 1 T. + 1,000 lb. = 3,000 lb.
- 1 lb. - 12 oz. = 4 oz.

**Down**

- 43 lb. + 3,957 lb. = 2 T.
- 14 oz. + 18 oz. = 2 lb.
- 80 oz. + 32 oz. = 7 lb.
- 1 T. + 800 lb. = 2,800 lb.
- 3 lb. + 4 oz. = 52 oz.
- 2 T. - 1,600 lb. = 2,400 lb.
- 500 lb. + 48 oz. = 503 lb.
- 2 lb. - 21 oz. = 11 oz.

## Additional Resource 42



### Math Poster M Pounds

The elephant weighs 8,013 pounds.  
The hippopotamus weighs 3,817 pounds.  
The rhinoceros weighs 6,924 pounds.  
See Answer Key for extensions.

## Daily Maintenance

Round each number to the nearest thousand.

- 7,134 [7,000]
- 3,784 [4,000]
- 2,318 [2,000]
- 5,900 [6,000]
- 6,500 [7,000]
- 9,299 [9,000]

**Using Problem-Solving Strategies, page 417**



## Objective 43

Choose an appropriate measure of capacity using cup, pint, quart, or gallon.

### Vocabulary

Cup, pint, quart, gallon

### Materials

- Measuring cups (Math Kit)
- Pint, quart, gallon containers

### Introduction

Review the customary measures of length and weight. Tell students that today they will be learning about customary units used to measure capacity.

**Using Concrete Materials** Have students bring empty milk containers to class. Divide the class into groups of 4 or 5 students. Supply each group with at least one cup, pint, quart, and gallon container. Have students find how many cups are in a pint by filling the cup measure with water and emptying it into the pint measure until the pint container is full. Have them repeat the procedure to find how many pints are in a quart and how many quarts are in a gallon. Each group should record their results. Have the students use their results and the pictures on this page to answer the following questions. How many cups are in a quart? [4] How many pints are in a gallon? [8] How many cups are in a gallon? [16] Have each group explain how they found the answers to these questions. Explain that there is often more than one way to solve a problem.

### Using the Pages

**Teach** Have students give examples of containers that have capacities of one cup, one pint, one quart, and one gallon.

**Try Estimation** Have on hand containers of various sizes. Ask students to estimate the capacity of each container. It may be helpful to ask if each container is more or less than a cup, pint, quart, or gallon. Point out that in Exercise b students are estimating the total capacity of the fuel tank, 18 gal. (A fuel tank could hold 18 c. or 18 pt. when not full.)

**Practice** Be sure to accept any answers that students can reasonably defend.

## Cup, Pint, Quart, and Gallon

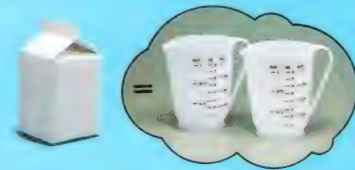
The *cup*, the *pint*, the *quart*, and the *gallon* are customary units for measuring liquids.

- A.** This container holds one cup (1 c.).



1 c.

- B.** This container holds one pint (1 pt.).



1 pt. = 2 c.

- C.** This container holds one quart (1 qt.).



1 qt. = 2 pt.

- D.** This container holds one gallon (1 gal.).



1 gal. = 4 qt.

### Try

- a. Estimation** Would you use cups or gallons to measure the amount of liquid a soup bowl holds?  
**Cups**
- b. Estimation** Choose the most sensible measure for a car's fuel tank.

18 c.    18 pt.    18 gal.  
**18 gal.**

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## Practice 43

**Practice 43**

Circle the unit you would use to measure the amount of liquid each container holds.

- A milk glass  
cup or gallon
- A washing machine  
pint or gallon
- A large mixing bowl  
pint or quart
- A teapot  
cup or quart
- A vase for flowers  
cup or gallon
- A gasoline tank in a car  
pint or gallon

Circle the more sensible measure.

- Kitchen sink  
6 pt. or 6 gal.
- Large cooking pot  
3 c. or 3 qt.
- Thermos bottle  
1 c. or 1 qt.
- Can of house paint  
1 c. or 1 gal.
- A large sprinkling can  
2 pt. or 2 gal.
- A laundry tub  
7 c. or 7 gal.

13. 1 c. or 1 qt.

14. 10 pt. or 10 gal.

Use other pages 112-113

## Reteaching 43

**Reteaching 43**

The cup (c.), the pint (pt.), the quart (qt.), and the gallon (gal.) are customary units for measuring liquids.

1 pt. = 2 c.  
1 qt. = 2 pt.  
1 gal. = 4 qt.

1 cup (c.)    1 pint (pt.)    1 quart (qt.)    1 gallon (gal.)

Circle the more sensible measure.

- 2 c.    2 gal.
- 5 c.    5 gal.
- 40 qt.    40 gal.
- 2 c.    2 qt.
- 1 c.    1 gal.
- 3 c.    3 gal.
- 30 c.    30 gal.
- 2 c.    2 qt.
- 2 c.    2 gal.



**Practice Estimation** Choose the unit you would use to measure the amount of liquid each container holds.



1. Dog's water bowl  
(cup or gallon)  
**Cup**
2. Swimming pool  
(quart or gallon)  
**Gallon**
3. Cream pitcher  
(cup or quart)  
**Cup**
4. Ice-cube tray  
(pint or gallon)  
**Pint**

**Estimation** Choose the more sensible measure.

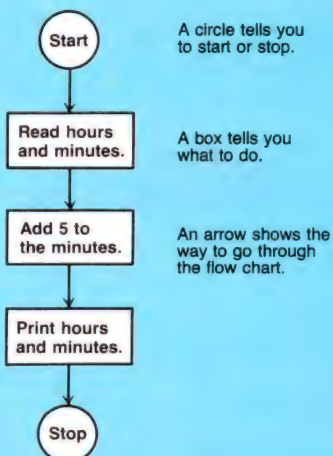
5. Milk-shake glass  
1 pt. 1 gal.  
**1 pt.**
6. Water cooler  
10 c. 10 gal.  
**10 gal.**
7. Water glass  
1 c. 1 qt.  
**1 c.**
8. Sand pail  
2 c. 2 qt.  
**2 qt.**
9. Baby's bottle  
1 c. 1 gal.  
**1 c.**
10. **Find the facts.** Use data from the table on page 5 to tell how much more a boxer weighs than a collie.  
**28 pounds**

More Practice Set 43, page 367

## COMPUTER

### Flow Charts

A flow chart shows the steps to use to solve a problem. This flow chart shows how to find the time 5 minutes after a given time.



1. What step comes before adding 5 to the minutes?  
**Read hours and minutes.**
  2. What step comes after adding 5 to the minutes?  
**Print hours and minutes.**
- Use the flow chart to give the time 5 minutes after
3. 3:08. **3:13**
  4. 6:41. **6:46**
  5. 11:15. **11:20**
  6. 2:25. **2:30**
  7. Make a flow chart that finds the time 10 minutes after a given time.  
**See margin.**
  8. Why won't the flow chart work if the time you read is 11:55?  
**See margin.**

113

## Assignment Guide

basic 1-10  
average 1-10  
enriched 1-10

**More Practice Set 43, page 367**

### Computer

Using flow charts can help students organize the steps for an activity. Tell them that computer programmers often write big flow charts to plan programs they are about to write.

If your class has a regular routine for morning activities, or for getting ready for lunch, you might show the steps in a flow chart. Ask students to write flow charts for the things they do at home before coming to school.

### Follow-Up

**Reteaching** Have students make cards for their file boxes (*Reteaching*, page 109) that will show capacity. On the back of each card, students should write whether the object could best be measured in *cups*, *pints*, *quarts*, or *gallons*.

### Enrichment Use data from outside the text

Have students look up the following words in the dictionary to find out their meanings as units of measurement: butt [108-126 gal.], firkin [9 gal.], hogshead [63 gal.], pipe [126 gal.], puncheon [70-120 gal.], tierce [42 gal.], and tun [252 gal.]. Then have students write problems using these units.

## Enrichment 43

Name: \_\_\_\_\_ E43

**Science Project II**

You will need: 4 gallon jars, marked with quarts, pints, and cups  
4 quart jars, marked with pints and cups  
6 pint jars, marked with cups

Use the smaller containers to obtain the amounts given in the addends of each exercise. Pour those into larger containers to find the sum.

1. 4 pt. 1 c.  
+ 2 pt. 1 c.  
6 pt. 2 c.  
or  
3 qt. 1 pt.
2. 1 qt. 1 c.  
+ 1 pt.  
1 qt. 1 pt. 1 c.  
or  
2 qt. 1 pt.
3. 2 pt.  
+ 1 pt. 4 c.  
3 pt. 4 c.  
or  
2 qt. 1 pt.
4. 3 qt. 1 pt.  
+ 1 qt. 1 pt.  
4 qt. 2 pt.  
or  
1 gal. 1 qt.
5. 3 pt. 1 c.  
+ 1 pt. 2 c.  
4 pt. 3 c.  
or  
2 qt. 1 pt. 1 c.
6. 1 gal. 1 pt.  
+ 3 qt. 1 pt.  
1 gal. 3 qt. 2 pt.  
or  
2 gal.

Use the larger containers to obtain the amounts given in the minuend of each exercise. Pour off the amounts in the subtrahend into smaller containers to find the difference.

7. 3 gal. 3 qt.  
- 1 gal. 2 qt.  
2 gal. 1 qt.
8. 3 qt. 1 pt.  
- 2 qt. 1 pt.
9. 1 gal.  
- 2 qt. 1 pt.  
1 qt. 1 pt.
10. 3 qt.  
- 1 qt. 1 pt.  
1 qt. 1 pt.
11. 2 gal. 1 qt.  
- 1 gal. 1 pt. 1 c.  
1 gal. 1 pt. 1 c.
12. 3 gal.  
- 2 pt.  
2 gal. 3 qt.

## Additional Resource 43

Name: \_\_\_\_\_ Additional Resource 43

**Maintenance**

Add or subtract.

1. \$4 63  
+ 0 32  
\$4.95
2. \$4 63  
+ 0 32  
\$4.31
3. \$8 00  
+ 1 46  
\$6.54
4. \$5 27  
+ 3 69  
\$8.96
5. \$14 23  
+ 1 95  
\$11.48
6. \$2 60 5  
+ 9 76  
\$16.29
7. \$0 87  
+ 0 94  
\$1.81
8. \$2 39 5  
+ 1 79  
\$25.74
9. \$2 00 0  
+ 1 19 5  
\$8.05
10. \$5 00  
+ 1 88  
\$3.12
11. \$1 99 5  
+ 1 89  
\$21.84
12. \$4 99  
+ 9 87  
\$14.86

Use the table to help you solve each problem.

13. What is the total cost of a bat and 2 pencils?  
\$5.75
14. Carlos bought a book and 2 pencils. He paid for them with a \$20.00 bill. How much change did he receive?  
\$11.47

Item	Cost
Bat	\$4.99
Book	\$7.77
Pencil	\$0.38

### Daily Maintenance

**Choose a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

1.  $4 + 7 + 6$  [17]
2.  $27 + 5 + 63$  [95]
3.  $39 + 24 + 18$  [81]
4.  $171 + 64 + 23$  [258]
5.  $634 + 218 + 735$  [1,587]
6.  $393 + 21 + 87 + 456$  [957]

Answers, page 113

See page 119 of this Teacher's Edition.



## Using Problem-Solving Strategies

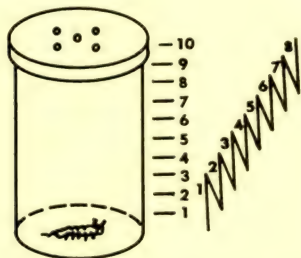
- Draw a diagram.
- Make a table.
- Find a pattern.

### Introduction

Students draw diagrams or make tables to follow the motions of a caterpillar and a snail and find patterns in their progress from day to day.

### Using the Pages

For Problems 1–5, some students may draw a *diagram* that might look like this:



Other students might *make a table*.

Day	Up 3 cm	Down 2 cm
1	3	1
2	4	2
3	5	3
4	6	4
5	7	5
6	8	6
7	9	7
8	10	

After students have had an opportunity to try to solve this problem, have them explain to their partners how it was solved. Then have some of the students write and explain their methods on the board. Compare the different methods.

Ask a student to read Problem 6 aloud. Discuss whether the snail will be able to crawl out of the well when he reaches the top edge, or whether he will slide down and require an additional day. If students decide that he will be able to crawl out, the snail problems have the same pattern as the caterpillar problem. The discussion below is based on the decision that the snail will be able to crawl out as soon as he reaches the top edge of the well.

If students are having difficulties with Problems 6 and 7, you may want to ask some of the following questions.

1. How high must the snail climb to get out of the well?

(Continued on page 115.)

## Using Problem-Solving Strategies

# THE CATERPILLAR CRAWL

A caterpillar is at the bottom of a jar that is 10 centimeters high and 5 centimeters across. The jar has a lid with holes in it. Each day, the caterpillar crawls up 3 centimeters. Each night, he slips down 2 centimeters. *How long will it take the caterpillar to touch the lid of the jar?*



1. How high must the caterpillar crawl to touch the lid of the jar?  
**10 cm**
2. How high can the caterpillar crawl during the first day?  
**3 cm**
3. How high can the caterpillar crawl in 2 days?  
**4 cm**
4. How high can the caterpillar crawl in 5 days?  
**7 cm**
5. How many days will it take the caterpillar to touch the lid of the jar?  
**8 days**

Find a partner and explain to him or her how you solved this problem. Compare the ways that you and your partner used to solve this problem with methods used by others.



## CALCULATOR

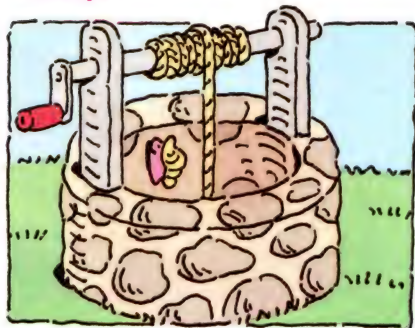
### JOHNSON'S MEAT MARKET PRICES

Baked Ham	\$2.78 per lb.
Whole Chicken	\$0.54 per lb.
Beef Liver	\$0.59 per lb.
Boston Beef Roast	\$1.89 per lb.
Smoked Sausage	\$1.99 per lb.
Turkey Breast	\$2.79 per lb.

Choose a method to solve the following problems.

6. A snail is trying to climb out of a 12-meter well. He crawls up 3 meters each day and slides back 2 meters each night. How long will it take him to climb out of the well?

**10 days**



7. If the same snail falls into a 15-meter well, how long will it take him to climb out of the well?

**13 days**

8. The poor snail fell into another well. This time it took him 16 days to climb out. How deep was the well?

**18 meters**

9. Another caterpillar can crawl up 4 centimeters each day. Each night, he slips down 2 centimeters. How long will it take him to touch the lid of the jar that is 10 centimeters high?

**4 days**

Use your calculator to complete these orders.

1.	3 lb. of chicken	\$1.62
2.	2 lb. of sausage	3.98
3.	1 lb. of liver	0.59
4.	2 lb. of roast	3.78
5.	1 lb. of ham	2.78
6.	total	\$12.75

7.	2 lb. of ham	\$5.56
8.	3 lb. of roast	5.67
9.	1 lb. of sausage	1.99
10.	3 lb. of turkey	8.37
11.	2 lb. of chicken	1.08
12.	total	\$22.67

115

## Assignment Guide

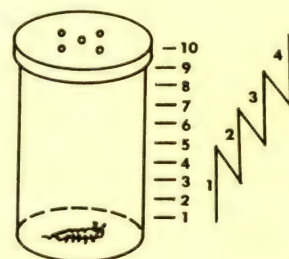
basic	1-7
average	1-8
enriched	1-9

(Continued from page 114.)

- How high can the snail crawl during the first day?
- How high can the snail crawl in 2 days?
- How high can the snail crawl in 5 days?
- Do you see a *pattern* between the number of meters that the snail can crawl and the number of days? Each day, the snail can crawl to a height 2 meters more than the number of days. Therefore, when the snail is crawling out of the 12-meter well, it will take him 10 days. In Problem 7, it will take the snail 13 days to crawl out of a well that is 15 meters deep.

Using the pattern for Problem 8 means the well must be 18 meters deep if the snail takes 16 days to crawl out.

For Problem 9, students should draw a picture or make a table to show that the caterpillar touches the lid on the fourth day.



### Daily Maintenance

Solve each problem.

- Carey let his hot air balloon rise 264 feet. Then he let it descend 187 feet. How many feet was he above the ground then? [77 feet]
- Mitzi drove 264 miles to Durham. Then she drove 187 miles to Hebner. How many miles did she drive in all? [451 miles]
- One store is selling a color TV for \$264. Another store is selling the same TV for \$187. Which TV is the better buy? [The TV for \$187]



## Objective 44

Choose an appropriate temperature using degrees Celsius or degrees Fahrenheit.

### Vocabulary

Celsius, Fahrenheit

### Materials

- Thermometer (Math Kit)

## Introduction

Ask students if they listen to weather reports on radio or TV. Ask how the temperature is given. Lead into a discussion of degrees Celsius and degrees Fahrenheit.

**Warm-Up Review** Have the students round the numbers to the nearest ten.

1. 16 [20]
2. 42 [40]
3. 64 [60]
4. 87 [90]

**Using Concrete Materials** Set up four measuring stations. For example, one outside the classroom window for outdoor temperature, one inside for classroom temperature, one in a bucket of ice water, and one in a container of warm water. Have the students record the temperatures in degrees Celsius and Fahrenheit. Explain that even though the degrees Celsius and Fahrenheit are different they are both measurements of the same temperature.

## Using the Pages

**Teach** Read the example. Discuss the two temperature scales. Remind students that thermometers are read at the top of the liquid. Compare the boiling points of water and the freezing points. Ask several questions such as which scale shows 55° on a cool day, [Fahrenheit] which scale shows 40° on a very hot day [Celsius]. Ask which scale shows 0° on a very cold day. [Fahrenheit]

**Try** Have students use the thermometers in the example to help them choose sensible answers for Exercises a and b.

**Practice Problem Solving** Have students compare the temperatures given in Exercises 9–16 with the temperatures given on the thermometers on this page. For example, for Exercise 9, ask them if it would be more sensible to paint a house on a cold day, 22°F, or on a day when it is about room temperature outside, 22°C. [When it is about room temperature outside, 22°C]

Accept any answers a student can reasonably defend.

## Temperature: Celsius and Fahrenheit

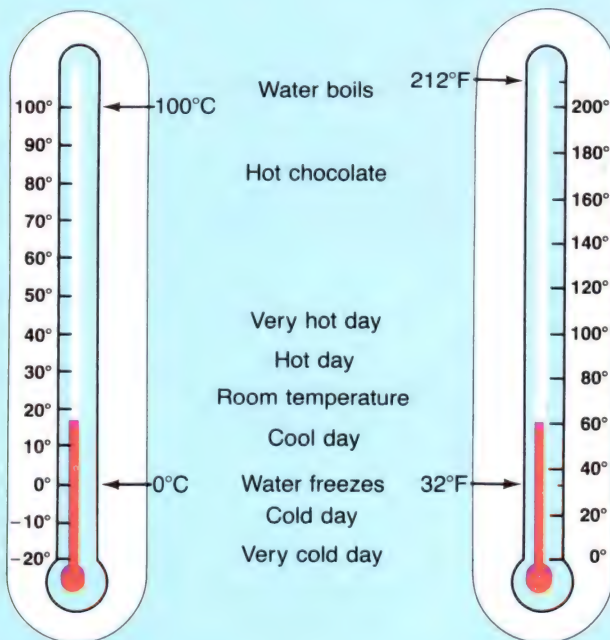


A sign at the Bagley Bank shows temperature in degrees Celsius (°C) and in degrees Fahrenheit (°F).

Thermometers are used to measure the temperatures reported on the sign.

Celsius Thermometer

Fahrenheit Thermometer



## Practice 44

Circle the more sensible measure

1. Temperature of a school auditorium: 33 F or 69 F
2. Pleasant weather for baseball: 25 C or 75 C
3. Temperature of hot soup: 80 C or 20 C
4. Body temperature when you have a fever: 70 F or 100 F
5. Temperature of steamy oatmeal: 80 F or 120 F
6. Comfortable weather for ice skating: -10 C or 25 C

Give the more sensible measure. Use C (Celsius) and F (Fahrenheit).

7. Margaret is playing soccer. The temperature is 55 F
8. The Millers are preparing for a snowstorm. The temperature is 27 F
9. Richard is drinking ice-cold lemonade. The temperature of the lemonade is 6 C
10. John and his friends are about to go hiking. The temperature is 19 C
11. Mrs. Mendez is planting vegetables in her garden. The temperature is 20 C
12. Stanley went to the kitchen to get warm dinner rolls. The temperature of the rolls is 50 C
13. Children from the neighborhood are about to build a snowman. The temperature is 24 F
14. Mr. Spencer thinks that it is much too cold to play tennis. The outdoor temperature is 33 F

## Reteaching 44

Circle the more sensible answer

1. Bike-riding weather: 25°C or 25°F
2. Making a snowball: 10°C or 10°F
3. Frying a hamburger: 180°C or 180°F
4. Arctic Ocean: 40°C or 40°F
5. Wearing a jacket: 50°C or 50°F
6. Water for cooking spaghetti: 100°C or 100°F
7. Fresh-baked bread: 50°C or 50°F
8. Normal body temperature: 37°C or 37°F



## Try

- a. **Estimation** Choose the more sensible measure for the temperature in ice-skating weather.

25°F 84°F  
25°F

- b. **Estimation** Give the more sensible measure. Use C (Celsius) or F (Fahrenheit).

Tom is going on a picnic. It is 25°. **C**

**Practice Estimation** Choose the more sensible measure.

1. Temperature of a school room

32°F 68°F  
68°F

3. Temperature of hot chocolate

78°F 170°F  
170°F

5. Hiking weather

18°C 55°C  
18°C

7. Temperature during a blizzard

-15°C 15°C  
-15°C

2. Snowman-building weather

28°F 84°F  
28°F

4. Swimming weather

30°F 85°F  
85°F

6. Temperature of swimming-pool water

27°C 85°C  
27°C

8. Temperature of warm dinner rolls

50°C 125°C  
50°C

**Estimation** Give the more sensible measure. Use C (Celsius) or F (Fahrenheit).

9. Casey is painting his house. The temperature is 22°. **C**

11. Tom is shoveling snow off the walk. The temperature is 28°. **F**

13. Alvin is playing football. The temperature is 45°. **F**

15. Carol is sunbathing. The temperature is 25°. **C**

17. **Mental math** In the morning, the temperature was 39°F. By noon it was 49°F. How many degrees had the temperature risen?  
10°F

10. Violet is taking a bath. The water's temperature is 104°. **F**

12. Glen set the thermostat in his house at 68°. **F**

14. Joel is drinking ice water. The water's temperature is 3°. **C**

16. Emilia is boiling water to cook eggs. The water is 100°. **C**

18. **Mental math** In the morning, the temperature was 14°C. By afternoon, it had gone up 5°C. What was the afternoon temperature?  
19°C

More Practice Set 44, page 367 117

## Assignment Guide

basic 1-12, 17-18  
average 1-18  
enriched 1-18

More Practice Set 44,  
page 367

## Follow-Up

**Extra Practice** Draw a thermometer marked in degrees Fahrenheit on the board. Shade a region to show a particular temperature. Ask a student to read the temperature and give an example of something that would have that temperature. Repeat with other shaded regions. Then repeat the activity using a Celsius thermometer.

**Reteaching** Have students use the two thermometers on page 116 when doing Exercises 1-16.

**Enrichment** 1. Have students bring to school articles from newspapers and magazines that mention temperature, and use them to make up a bulletin board in the classroom.  
2. Encourage students to find out how the two temperature scales got their names. [The Celsius scale is named for Anders Celsius (1701-1744), a Swedish astronomer who made up the scale in 1742. The Fahrenheit scale is named for the German physicist who developed it, Gabriel Daniel Fahrenheit (1686-1736).]

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic, and then give reasons for their choices.

- 2,100 + 1,400 + 700 [4,200]
- 9,876 - 5432 [4,444]
- 270 - 180 [90]
- 376 - 149 [227]
- 579 + 135 + 246 + 801 [1,761]
- 825 + 150 [975]

## Daily Maintenance

Write each number in standard form.

- Six thousand, three hundred eighty one [6,381]
- Two thousand, ninety-seven [2,097]
- Eight thousand, two hundred [8,200]
- Five thousand, three hundred twelve [5,312]
- Seven thousand, six [7,006]
- Fifteen thousand, eleven [15,011]

## Enrichment 44

Name \_\_\_\_\_ E44

**That's a Big Difference!**

Temperatures rise and fall each day.

One day, the temperature was 2°C. It rose 6° to 8°C. Then the temperature dropped 11° to 3° below zero or -3°C.

Complete the table.  
Use the thermometer to help you find each new temperature.

Temperature	Rise	New Temperature	Fall	Final Temperature
2°C	6°	8°C	9°	-1°C
26°C	8°	34°C	6°	28°C
13°C	4°	17°C	2°	15°C
4°C	3°	7°C	8°	-1°C
21°C	6°	27°C	6°	21°C
-10°C	5°	-5°C	8°	-13°C
17°C	5°	22°C	3°	19°C
1°C	4°	5°C	7°	-2°C
-6°C	8°	2°C	4°	-2°C
3°C	4°	7°C	7°	0°C

## Additional Resource 44

Name \_\_\_\_\_ Additional Resource 44

**Computer BASIC: Changing Instructions**

Always number your program lines by tens so that you can add lines to your program.

Type lines 10-30 in the example at the right. Then type line 25. Type LIST. Write the outputs from LIST and RUN.

```

1. LIST 10 PRINT "100 YEARS"
        20 PRINT "IS A CENTURY"
        30 PRINT "THAT'S OLD!"
        40 END

2. RUN

3. Type LIST and press RETURN or ENTER.
   Then type the number 25. Type LIST
   again. Write what is shown for
   line 25.

You can change a line in your
program by typing the number of the
line you want to change, followed by
the new line.

Type the above program. Then
change line 20 by typing: 20 PRINT "IS 349"
Type LIST and RUN. Show the outputs for these commands.

4. LIST 10 PRINT "538 189"
        20 PRINT "IS 349"
        30 PRINT "THAT'S OLD!"
        40 END

5. RUN

6. REM ADDING
   20 PRINT "37 + 464"
   30 PRINT "37 + 464"
   40 END
    
```

The REM statement lets you put comments in your program that help someone else understand the program. The computer ignores REM statements. The program at the right uses REM.



## Chapter 4 Test

An acceptable score for each objective is suggested on the Chapter 4 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

Objective	Test Items	Text Pages
33	1,2	90–91
34	3,4	92–93
35	5	94–95
36	7,8	96–97
37	9	98–99
38	10	100–101
39	17	104–105
40	6	106–107
41	11,12	108–109
42	13	110–111
43	14	112–113
44	15,16	116–117

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
17	100	12	71
16	94	11	65
15	88	10	59
14	82	9	53
13	76	8	47

### Additional Ideas for Evaluation

See pages 464–467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 4 Form for Individualizing
- Cumulative Record Folder

## Chapter 4 Test

- Write the time shown on the clock.

**2:50**



- What time will it be 15 minutes later than the time shown on the clock above?

**3:05**

May						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

- What is the date of the third Monday in May?

**May 21**

- What day of the week is May 24?

**Thursday**

Measure the length to the nearest centimeter.

- \_\_\_\_\_
- 6 cm**

Measure the length to the nearest inch.

- \_\_\_\_\_
- 2 in.**

Choose the most sensible measure.

- Length of your thumb

6 cm    6 dm    6 m

**6 cm**

118

- Height of a volleyball net

2 dm    2 m    2 km

**2 m**

- Weight of a pencil

5 g    5 kg

**5 g**

- Amount of liquid a bowl holds

2 mL    2 L

**2 L**

- Height of a giraffe

17 in.    17 ft.    17 mi.

**17 ft.**

- Length of a bicycle race

2 ft.    2 yd.    2 mi.

**2 mi.**

- Weight of a tennis racket

2 ounces    2 pounds    2 tons

**2 pounds**

- Amount of water a wading pool holds

15 c.    15 gal.

**15 gal.**

- Temperature of a shower room

30°F    90°F

**90°F**

- Sledding weather

2°C    34°C

**2°C**

- Choose the most sensible estimate for the distance from the tent to the rock.

**8 km**

3 km    5 km    8 km



## Chapter 4 Letter Home

**Keeping You Posted**

We have completed the chapter on measurement in our mathematics textbook. The chapter included length, weight, liquid measure, and temperature. You might help your child practice estimating the length and weight of objects around your home. We will study multiplication facts through 9 × 9 next.

To: Family

Use the chart to color the star.

blue	length measure
yellow	weight measure
green	liquid measure
red	temperature

## Chapter 4 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Posttest Chapter 4**

- Write the time shown on the clock.

**12:55**

- What time will it be 20 minutes after the time shown on the clock above?

**1:15**

- What is the date of the third Wednesday in November?

**21**

- What day of the week is November 29?

**Thursday**

Measure the length to the nearest centimeter.

5. \_\_\_\_\_

**5 cm**

Measure the length to the nearest inch.

6. \_\_\_\_\_

**1 in.**

Choose the most sensible measure.

- Length of an eraser

4 cm    4 dm    4 m

**4 cm**

Name \_\_\_\_\_

**Posttest Chapter 4**  
continued

- Height of an apple tree

10 dm    10 m    10 km

**10 m**

- Weight of a dinner plate

400 g    400 kg

**400 g**

- Amount of water in a puddle

3 mL    3L

**3 L**

- Height of a desk lamp

24 in.    24 ft.    24 mi.

**24 in.**

- Length of a fishing rod

2 in.    2 yd.    2 mi.

**2 yd.**

- Weight of a car

2 ounces    2 pounds    2 tons

**2 tons**

- Amount of water in a tea kettle

2 c.    2 qt.

**2 qt.**

- Temperature of a freezer

15°F    75°F

**15°F**

- Swimming weather

5°C    30°C

**30°C**

- Choose the most sensible estimate for the distance from the anthill to the beehive.

3 m    4 m    7 m

**7 m**



## Estimation Strategies

A rough estimate can be obtained by using the *front-end* digits. The estimate can be *adjusted* by *grouping* the remaining digits.

Estimate the total cost.

		$1 + 5 + 4 + 2 + 4 + 6 = \$22$
Socks	\$1.19	
Scarf	5.79	← About \$1
Gloves	4.25	
Ring	2.29	← About \$1
Bracelet	4.49	
Purse	6.00	
Tax	0.95	← About \$1

Total cost: About \$25



Estimate each sum.

- $$\begin{array}{r} 129 \\ 915 \\ + 508 \\ \hline 1,500 \end{array}$$
- $$\begin{array}{r} 4,625 \\ 562 \\ + 918 \\ \hline 6,000 \end{array}$$
- $$\begin{array}{r} 2,375 \\ 182 \\ + 9,757 \\ \hline 12,000 \end{array}$$
- $$\begin{array}{r} 346 \\ 457 \\ 203 \\ + 512 \\ \hline 1,500 \end{array}$$
- $$\begin{array}{r} 107 \\ 912 \\ 700 \\ + 523 \\ \hline 2,200 \end{array}$$
- $$\begin{array}{r} 498 \\ 315 \\ 103 \\ + 97 \\ \hline 1,000 \end{array}$$
- $$\begin{array}{r} 3,813 \\ 1,044 \\ 2,110 \\ + 1,219 \\ \hline 8,000 \end{array}$$
- $$\begin{array}{r} 2,221 \\ 1,356 \\ 1,583 \\ + 9,940 \\ \hline 15,000 \end{array}$$
- $$\begin{array}{r} 54 \\ 62 \\ 90 \\ 93 \\ + 11 \\ \hline 300 \end{array}$$
- $$\begin{array}{r} 437 \\ 217 \\ 825 \\ 614 \\ + 143 \\ \hline 2,200 \end{array}$$
- $$\begin{array}{r} 281 \\ 203 \\ 94 \\ 112 \\ + 215 \\ \hline 900 \end{array}$$
- $$\begin{array}{r} 2,113 \\ 1,024 \\ 3,050 \\ 124 \\ + 1,272 \\ \hline 7,000 \end{array}$$
- $$\begin{array}{r} 11,035 \\ 31,116 \\ 20,135 \\ 11,846 \\ + 20,913 \\ \hline 95,000 \end{array}$$
- $$\begin{array}{r} \$3.85 \\ 2.19 \\ 0.45 \\ 1.58 \\ + 4.05 \\ \hline \$12.00 \end{array}$$
- $$\begin{array}{r} \$5.29 \\ 6.18 \\ 4.75 \\ 3.09 \\ + 5.19 \\ \hline \$24.00 \end{array}$$
- $$\begin{array}{r} \$8.05 \\ 4.33 \\ 1.52 \\ 6.25 \\ + 0.93 \\ \hline \$21.00 \end{array}$$
- $$\begin{array}{r} \$2.16 \\ 4.87 \\ 2.45 \\ 1.29 \\ + 5.00 \\ \hline \$15.00 \end{array}$$
- $$\begin{array}{r} \$5.75 \\ 2.32 \\ 7.05 \\ 1.80 \\ + 6.99 \\ \hline \$24.00 \end{array}$$

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## Estimation Strategies

This page reviews some strategies that have been taught earlier and introduces some new strategies.

The estimating presented in this lesson is sometimes called *front-end* estimating with adjusting. Students estimate using the first digits of the numbers and then adjust this estimate by considering the other digits.

Before students use the lesson you might have them select, from a set of two-digit numbers, those which have sums close to 100. For example:

37, 91, 49, 54, 28, 15, 32 [37, 28, and 32; 91 and 15; 49 and 54]

Discuss the example and, if necessary, Exercises 1–3. In the example, a rough estimate is made by adding the digits in the ones (dollar) column. Notice that 0.95 has 0 dollars. Then this estimate is adjusted by considering the "cents" portion of each number and finding sums of about \$1.00. Exercises 1, 2, and 3 show students how to estimate with whole numbers. In Exercise 1, no adjusting is necessary.

Extend the lesson by showing students how to do *front-end* estimation with subtraction.

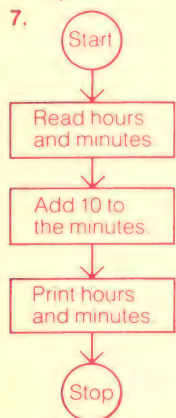
$$\begin{array}{r} \$6.38 \\ - 2.89 \\ \hline \end{array}$$

$$\begin{array}{r} 871 \\ - 324 \\ \hline \end{array}$$

Have students subtract the ones (dollar) column. [\$4] Then have them compare the "cents." If the numbers are fairly close, no adjusting is needed. However, in the first example \$0.38 is about \$.50 less than \$0.89. Therefore, the estimate should be adjusted down to \$3.50. In the second example, since the difference between 71 and 24 is about 50, the estimate should be increased to 550.

### Answers, page 113

#### Computer



8. The time would be written as 11:60 instead of 12:00.



## Using Problem-Solving Strategies

- Solve a simpler problem.

### Materials

- Inch ruler (Teaching Aid F, Punch-outs, or Math kit)

### Introduction

It is suggested that the students solve this problem as a series of *simpler problems*. These simpler problems involve finding the time the family arrives at Snake River Bridge, the time they arrive at Round Lake, and finally, the time they arrive back at Frontier Park.

### Using the Page

Read the problem with the students and have them trace the hiking trail with their fingers. Then use Problem 1. Make sure the students understand that for each hour the Kubistas walk along the trail they cover 3 miles. Discuss how far they can walk in 1 hour [3 miles], in 2 hours [3 + 3, or 6, miles], and in 3 hours [3 + 3 + 3, or 9, miles].

For Problems 2, 3, and 4, students will need their rulers. For Problem 2, have them measure the distance on the map from Frontier Park to the Snake River Bridge. [6 in.] Then ask them how many miles 6 inches represents. [6 miles] If students have difficulty giving this answer, have them trace the trail and mark off one-inch segments along the trail and count each segment as 1 mile. From Problem 1, students know that the family walks 6 miles in 2 hours. If they left the park at 9:00 A.M., they will reach the bridge at 11:00 A.M. For Problem 4, students will use the same procedures as in Problems 2 and 3. You may want to ask: "How far is it on the map from the bridge to the falls? [2 in.] How far is it on the map from the falls to the lake? [1 in.] How far is it on the map from the bridge to the lake? [2 + 1, or 3 in.] How many miles is it from the bridge to the lake? [3 mi.] How long does it take the Kubistas to walk 3 miles? [1 hr.] What time will they arrive at the lake?" [12:00 noon]

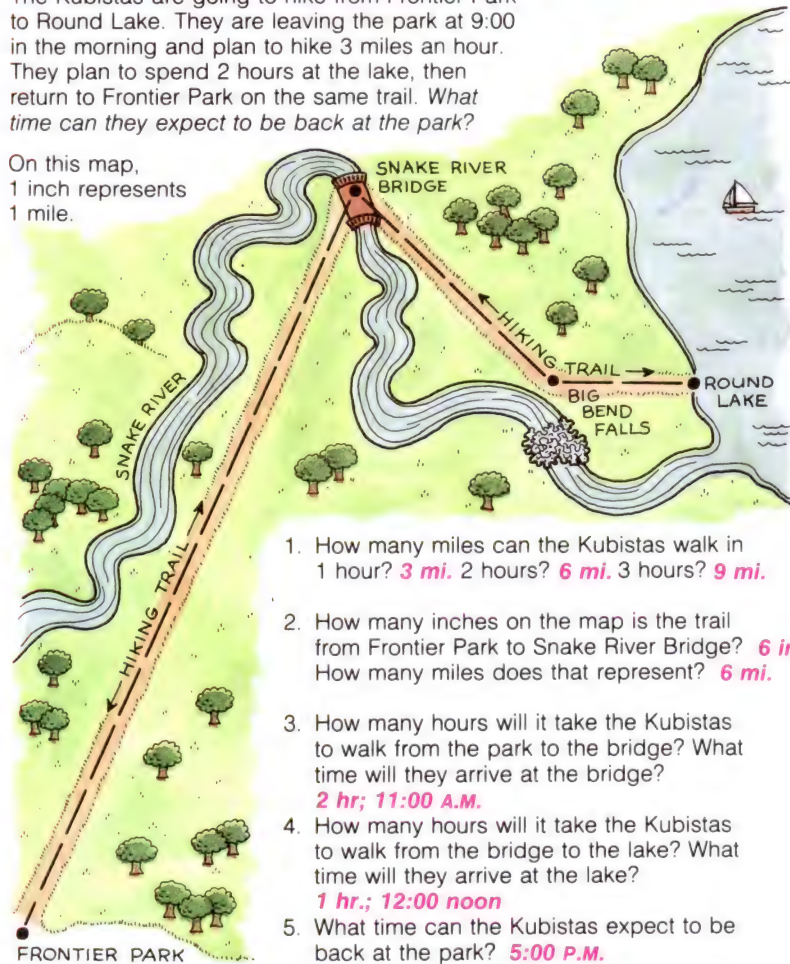
If students have difficulty with Problem 5, ask these questions: "How long will the Kubistas spend at the lake? [2 hr.] What time will they leave? [2:00 P.M.] How long will it take them to walk back to the bridge? [1 hr.] What time will they arrive at the bridge? [3:00 P.M.] How long will it take them to walk from the bridge to the park? [2 hr.] What time will they arrive back at the park?" [5:00 P.M.]

## Using Problem-Solving Strategies

# A FAMILY HIKE

The Kubistas are going to hike from Frontier Park to Round Lake. They are leaving the park at 9:00 in the morning and plan to hike 3 miles an hour. They plan to spend 2 hours at the lake, then return to Frontier Park on the same trail. What time can they expect to be back at the park?

On this map, 1 inch represents 1 mile.



1. How many miles can the Kubistas walk in 1 hour? **3 mi.** 2 hours? **6 mi.** 3 hours? **9 mi.**
2. How many inches on the map is the trail from Frontier Park to Snake River Bridge? **6 in.** How many miles does that represent? **6 mi.**
3. How many hours will it take the Kubistas to walk from the park to the bridge? What time will they arrive at the bridge? **2 hr.; 11:00 A.M.**
4. How many hours will it take the Kubistas to walk from the bridge to the lake? What time will they arrive at the lake? **1 hr.; 12:00 noon**
5. What time can the Kubistas expect to be back at the park? **5:00 P.M.**

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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 401



# chapter 5

## Multiplication Facts

### Mathematical Background

**Multiplication Concepts** The basic model for multiplication is repeated addition. That is, if there are sets of objects and each has the same number of objects, then the total of all of the objects can be found using multiplication rather than addition.

For example, if there are 6 bags of marbles, each bag containing 4 marbles, the total number of marbles can be found by either operation:

$$6 \text{ bags of marbles, 4 marbles per bag}$$

$$4 + 4 + 4 + 4 + 4 + 4 = 24$$

$$6 \text{ groups } \times 4 \text{ in each group}$$

$$6 \times 4 = 24$$

The numbers being multiplied are called *factors* and the answer to the problem is called the *product*. Multiplication problems can be expressed vertically or horizontally:

$$\begin{array}{r} 4 \text{ factor} \\ \times 6 \text{ factor} \\ \hline 24 \text{ product} \end{array} \quad \begin{array}{r} \text{factor} \\ 6 \end{array} \times \begin{array}{r} \text{factor} \\ 4 \end{array} = \begin{array}{r} \text{product} \\ 24 \end{array}$$

Although it may not be immediately apparent from the model, the order in which the factors are written has no effect on the product. For example, 6 bags containing 4 marbles per bag is the same as 4 bags containing 6 marbles per bag. This is called the *commutative law of multiplication* and may not be recognized by a student.

**Special Products** Multiplication by 1 or 0 has characteristics that deserve special attention. The number 1 is the identity element for multiplication. This means that if one of the factors is 1, the product is equal to the other factor. For example,  $1 \times 8 = 8$  and  $8 \times 1 = 8$ .

If 0 is one of the factors, the product is always 0. For example,  $7 \times 0 = 0$  and  $0 \times 7 = 0$ .

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### Pretest for Chapter 5

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

Pretest Chapter 5

Complete each sentence for the picture below.



1.  $6 + 6 + 6 = 18$

2.  $3 \times 6 = 18$

Multiply.

3. $\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$	4. $\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$	5. $\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$
6. $\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$	7. $\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$	8. $\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$
9. $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	10. $\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$	11. $\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$
12. $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$	13. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$	14. $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$
15. $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$	16. $\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$	17. $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$

Answers:

1. 18

2. 18

3. 6

4. 8

5. 12

6. 27

7. 10

8. 24

9. 28

10. 36

11. 40

12. 20

13. 45

14. 15

15. 42

16. 30

17. 36

9

Name \_\_\_\_\_

Pretest Chapter 5

Multiply.

18. $\begin{array}{r} 0 \\ \times 5 \\ \hline \end{array}$	19. $\begin{array}{r} 3 \\ \times 1 \\ \hline \end{array}$	20. $\begin{array}{r} 1 \\ \times 8 \\ \hline \end{array}$
21. $\begin{array}{r} 2 \\ \times 0 \\ \hline \end{array}$	22. $\begin{array}{r} 7 \\ \times 0 \\ \hline \end{array}$	23. $\begin{array}{r} 9 \\ \times 1 \\ \hline \end{array}$
24. $\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$	25. $\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	26. $\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$
27. $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$	28. $\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$	29. $\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$
30. $\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$	31. $\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$	32. $\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$

Answers:

18. 0

19. 3

20. 8

21. 0

22. 0

23. 9

24. 63

25. 14

26. 49

27. 32

28. 40

29. 72

30. 18

31. 54

32. 81

10



# Teaching Chapter 5



## Problem Solving

**Five-Step Method** In this chapter, students are encouraged to formulate problems—to write or verbalize them and to present the solution. The problem-solving lesson gives students a chance to turn the READ step around and “write” their own problems based on consumer information provided.

**Problem-Solving Strategies** Your students will gain greater insight into problem solving when they are consistently encouraged to formulate their own problems. Additionally, they will learn to spot problems that provide *too little or too much information*.

Before starting a classroom discussion of a *Using Problem-Solving Strategies* problem, it is often a good idea to give students time to try the problem on their own. Before they begin, however, students should restate the problem in their own words so that you know whether students understand what they are to do. As students work through the problem, encourage them to “talk it through.” This simple process helps students organize their thinking and become better problem solvers.



## Calculators and Computers

**Calculators** In the activity suggested in the lesson notes on page 123, students see that the relationship between repeated addition and multiplication extends to computation that is more difficult than basic facts. It is a good idea to encourage students to generalize and to use the calculator to test their generalizations.

**Computers** In this chapter, students extend their knowledge of PRINT statements by using a semicolon at the end of a PRINT line to vary the output. They are also introduced to the symbol \* for multiplication, to replace the usual “times” sign— $\times$ .

Ask students if they can guess the reason for using this special symbol instead of  $\times$ . This simple explanation will help them understand, somewhat, how a computer works. It can be said that a word, letter, or number means only one thing to a computer, since computers cannot think. Whenever a computer sees a word, letter, or number, it will do only what it has been programmed to do, unless the word, letter, or number has quotation marks around it. Thus, if  $x$  meant *multiply*, the computer will always multiply when it encounters an  $x$ , even when the letter  $x$  is part of a word.



## Estimation and Mental Math

**Mental Math** Students learn multiplication basic facts in this chapter. Much of students' future success with mathematics is dependent on their being able to quickly recall multiplication basic facts. For this reason, it is a good idea to spend time during this chapter discussing strategies for recalling basic facts.

The easiest strategy for students to use is the *commutative property*. Students should know, for example, that  $2 \times 6$  is the same as  $6 \times 2$ . Another easy strategy for students to use is *skip counting*, or counting by multiples (for example, 3, 6, 9, 12, . . .). Students can count off the multiples on their fingers. When they get to the fourth finger, they know 4 times the number by which they are skip counting. Students should be able to skip count by 2, 3, 4, and 5. You might also want to encourage students to skip count by larger numbers, such as 6 and 7.

Students can use their knowledge of some facts to find other facts. Some students find  $6 \times 6$  an easier fact than  $7 \times 6$ . Students can *add on to a known product* to the first fact to find the second. For example, because  $6 \times 6$  means “6 groups of 6” and  $7 \times 6$  means “7 groups of 6,” students should see that they need one more group of 6 and add 6 to  $6 \times 6$  to find  $7 \times 6$ . Students can also use their knowledge of one fact to find its *double*. Students who know that  $4 \times 6 = 24$  can use that fact to find its double,  $8 \times 6 = 48$ .

Because the facts for 9 are difficult for many students, you might want to pay special attention to strategies for *multiplying by 9*. Show students the pattern in the multiples of 9—the digits for each multiple add to 9 and the first digit is 1 less than the number you are multiplying by 9. By this method for finding  $9 \times 8$ , for example, you know the first digit is 7 because  $8 - 1 = 7$ , and the second digit is 2 because  $9 - 7 = 2$ .

Another way to multiply a number by 9 is to multiply the number by 10, and then subtract the number. To find  $5 \times 9$ , use  $(5 \times 10) - (5 \times 1)$ , which equals  $50 - 5$ , or 45.



## Mental Math

The mental math cat appears throughout the book to tell students to compute mentally.





## Concrete Materials

The learning of multiplication facts can be made more meaningful with the use of concrete materials. As with basic addition and subtraction facts, students should become well-grounded in the concept of multiplication through the use of manipulatives, before working with numbers.

Suggest that the class think of items that could be used to illustrate each fact. For example: pairs of goggles for facts of two, clovers for facts of three, four-legged chairs for facts of four, hands for facts of five, jacks for facts of six, calendar weeks for facts of seven, Stop signs for facts of eight, and dominoes with 9 dots for facts of nine. Students could assemble the items and count by twos, threes, and so on.

As students use objects to illustrate the facts, lead them to discover the commutative property of multiplication. After students have displayed 4 groups of 7, for example, have them display 7 groups of 4. They should be able to see that the product of both facts is 28.

Once students understand the concept of multiplication through using concrete materials, the next step, using pictures of objects, should not be minimized or deleted. Having worked through each of the previous stages, students then will be ready to move on to work with the numbers themselves. As students do these lessons, encourage them to feel free to use objects, draw pictures, or make arrays, to help them learn the facts. It is very important that students understand the concept of multiplication thoroughly before moving on to the next chapter.



## Thinking Skills

One focus of this chapter is the thinking skill of **recalling factual knowledge** (practicing basic facts). Another major focus is **comprehending concepts**, specifically the meaning of multiplication. Note the many pictures of arrays and equal groups. Students **apply concepts** as they make up problems on pages 142–143 and as they *choose the operation* to solve problems throughout. The *Using Problem-Solving Strategies* pages reinforce **analyzing relationships** as students *try and check* and *work backward*.



## Teaching Techniques

**Questioning and Responding** When you are doing oral drills on basic facts, here's a good technique for getting responses from all the students. Have one student give an answer and then have the other students signal agreement (thumbs up), disagreement (thumbs down), or "not sure" (thumbs to the side).

When you want students to answer a question in class, avoid the temptation to call on a student who is misbehaving. The student probably won't have the answer. So little is accomplished, and you might alienate that student.

### Helping Students Read and Write Mathematics

As students read this chapter, remind them to study the pictures. These pictures often help teach the concept of multiplication by showing groups and arrays of objects. When students write multiplication problems, remind them to write the "x" symbol clearly so that it can be distinguished from a "+" symbol.

**Teaching Students with Special Needs** Low achievers and special education students will have trouble learning basic facts because of their memory deficiencies. They will need more practice during the chapter than the average students and will also need more maintenance work after the chapter. Remember to keep practice sessions short because these students have short attention spans. Tactile experiences may be needed for learning disabled students. Have them finger-trace the numbers and the operation sign. Having them read the facts aloud may help. Also, having them close their eyes before they answer may help block out distractions.

Your gifted students will benefit from **Enrichment 51**, because it develops pattern-recognition, problem-solving, and spatial-perception skills. After your students have completed the exercise, you can suggest they count the total possible number of squares in each diagram. (For example, in the 3-by-3 square, there are 9 small squares, some 2-by-2 squares, and the outer 3-by-3 square.) How many squares can they find on a checkerboard—an 8-by-8 square? Then have students make a list of all the possibilities.

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

Art: crafts (138–139)

Health: nutrition (134–135)

Reading: fantasy (132–133)



## Bulletin Board Suggestions

The posters shown here can be used with Chapter 5. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.

Give different ways to find the number of postcards.

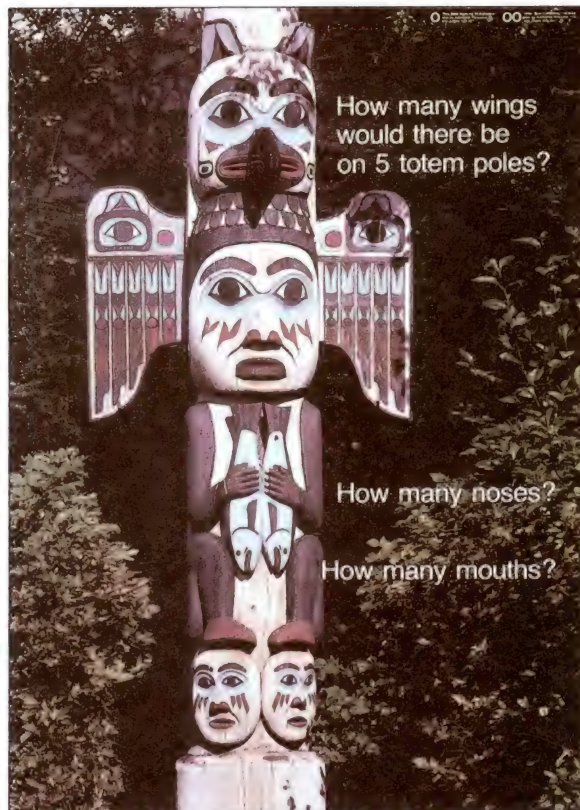


Math Poster N

### Multiplication Table

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

Math Poster P



Math Poster O

## Materials Chapter 5

- Counters (Punchouts or Math Kit) 122–125, 130–133, 136–139
- Graph paper 122–123
- Drawing paper 124–125, 132–133
- Crayons 124–125, 132–133
- Cards: factors and products 124–125
- Nine toy cars 126–127
- Flashcards 126–127, 136–137, 140–141
- Hexagon pattern blocks (Math Kit) 128–129
- Toothpicks 128–129
- Books 132–133
- Calendars 134–135
- Small objects 138–139
- Spinners (Math Kit) 140–141
- Grid of dots 140–141
- Classroom objects 142–143
- Catalogs 142–143



#### Basic Situation

Use the picture on this page to generate a discussion about plants and how fast they grow. Ask the question, "What can we do to help plants grow?" Have students work in groups to grow radish and/or bean seeds over a 3-week period to see if their hypotheses about caring for plants are effective. (You might give each group six 8-oz. cups with a hole in the bottom for drainage, a pie plate to catch excess water, and 4 radish and 4 bean seeds.) You may want to require all groups to record the data using metric units.

#### Possible Problems

- What kind of soil should be used?
- How deep should the seeds be planted?
- How much water should the plants get?
- Should fertilizer be used?
- How should plant growth be measured?

#### Indicators of Success

Students will need to consult resources such as magazines, books, and parents to obtain background information.

Students should keep accurate measurements of the amounts of sand, potting soil, peat moss, fertilizer, water, and anything else that is being controlled.

As students discuss how to measure plant growth, they may decide to find the length of the sprout, the number and length of leaves, the surface area of the leaves, and so on.

Students might also consider the costs involved. A group that used a lot less soil additives, but produced a plant that was only slightly smaller may decide that their method of care was the most cost effective.

Students will need to decide how to display their results—whether to use tables, graphs, or photographs.

#### Ways to Help

Encourage students whose plants do not grow as fast as others to alter their methods of caring for their plants.

Encourage students to keep an organized record of the things that are measured. See *Possible Results* for one method of recording the information.



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

#### Possible Results

Students might organize their work as shown.

Cup A

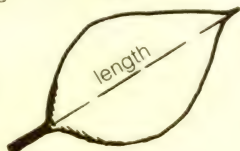
Type of Seed: _____	Amount of: _____
Number of Seeds: _____	Sand: _____
Date Planted: _____	Potting Soil: _____
Date Sprouted: _____	Peat Moss: _____
Number of Sprouts: _____	Fertilizer: _____

	17 Days	14 Days	21 Days
Number of Leaves:			
Length of Leaves:			
Height of Plant:			

Measures that might be made:



Length of sprout





## Objective 45

Write addition and multiplication equations.

### Lesson Theme

School Activities: School Play

### Materials

- Counters (Punchouts or Math Kit)
- Graph paper

## Introduction

**Using Concrete Materials** Have students arrange 15 counters into 5 groups of 3 counters. Stress that each group has the same number of counters. Ask what addition sentence can be written to show how many counters there are in all. Write  $3 + 3 + 3 + 3 + 3 = 15$  on the board. Tell students they could also write the multiplication sentence  $5 \times 3 = 15$ . Explain that multiplication is a special way of adding when the number of groups is known and the number in each group is the same.

Repeat this activity with other groups of counters. Then have students draw pictures to illustrate multiplication sentences.

## Using the Pages

**Teach** In Example A, groups need to consider the size of the gym and how many chairs the gym can hold. Students should recognize that chairs must be arranged in rows with aisles for access. The aisles separate the rows of chairs into groups. Students should pick a reasonable number of audience members and make a seating plan to accommodate this number, adjusting the number or the plan when necessary. The choice of operation depends on whether or not students have planned to form equal groups of chairs. If equal groups have been planned, students can either multiply or add. If unequal groups have been planned, students should add. Accept all reasonable methods that students offer. Have students explain and defend their choices.

Have students study the chart in Example B. After students have answered all of the problems, ask them to explain the relationship between addition and multiplication. [Multiplication and addition are both operations that join groups. With addition, the groups may or may not be equal. With multiplication, the groups must be equal.]

## Meaning of Multiplication

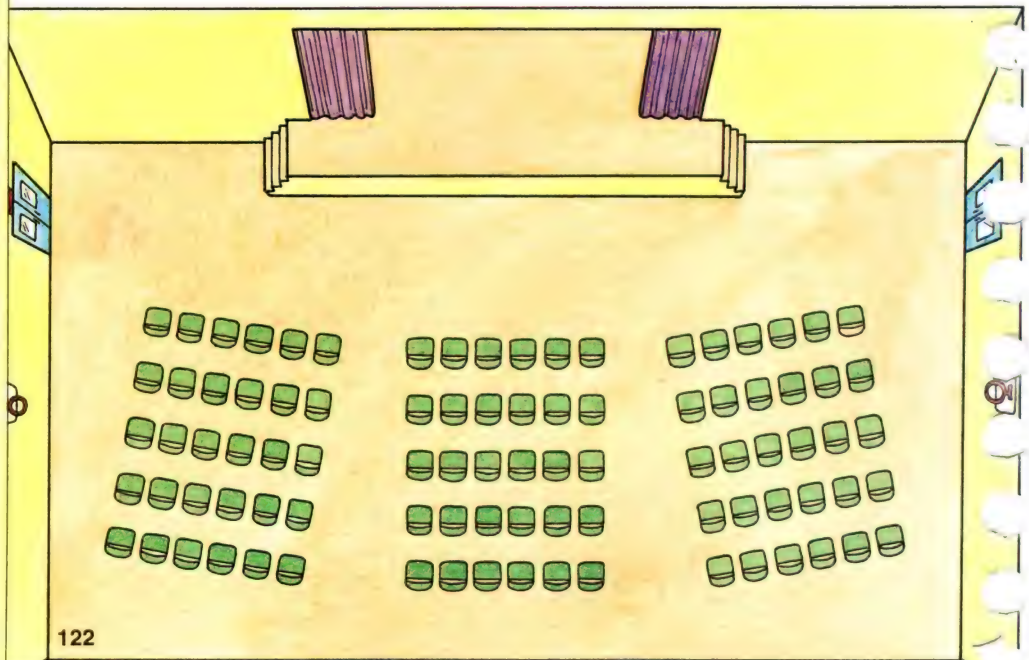
- A. If a school play is held in a gym, a seating plan needs to be made.

Work in groups of four. Each group should first make a drawing of a school gym with a stage. Their group should draw a model of a seating plan. You can use graph paper or counters to help you.

As you work on your seating plan, remember the following:

- everyone must be able to see the stage;
- ushers need an orderly arrangement to find each individual seat;
- there must be enough room for people to get to and from their seats comfortably;
- there must be the same number of seats in each row.

What were some other things your group considered when it made the seating plan? Share your findings with other groups in the class. **See Using the Pages.**



## Practice 45

Complete each sentence.

1.  $6 \div 6 \div 6 = \underline{18}$

2.  $8 \div 8 \div 8 = \underline{24}$

3.  $7 \div 7 \div 7 = \underline{14}$

4.  $3 \div 3 \div 3 \div 3 \div 3 = \underline{15}$

5.  $6 \div 6 \div 6 \div 6 \div 6 = \underline{24}$

6.  $8 \div 8 \div 8 = \underline{16}$

7.  $3 \div 3 \div 3 \div 3 \div 3 \div 3 \div 3 = \underline{21}$

8.  $9 \div 9 \div 9 \div 9 \div 9 = \underline{36}$

## Reteaching 45

How many flowers are in the picture?

You can count. 1, 2, 3, ..., 15

You can add 3 fives.  $5 + 5 + 5 = 15$

You can use a multiplication sentence.  $3 \times 5 = 15$

There are 15 flowers.

Complete each sentence.

1.  $2 \div 2 = \underline{4}$

2.  $3 \div 3 \div 3 = \underline{9}$

3.  $2 \div 2 = \underline{4}$

4.  $3 \div 3 \div 3 = \underline{9}$

5.  $4 \div 4 \div 4 = \underline{12}$

6.  $3 \div 3 \div 3 \div 3 \div 3 = \underline{18}$

7.  $5 \div 5 \div 5 \div 5 = \underline{20}$

8.  $3 \div 3 \div 3 \div 3 \div 3 = \underline{18}$

9.  $2 \div 2 \div 2 \div 2 = \underline{10}$





Your group must also order folding chairs for the play. How many chairs are needed for your seating plan? You can use a calculator to help you. **See Using the Pages.**

1. How did you find the total number of chairs needed?
2. Can you compute the answer another way? Why or why not?

Trade your plans with another group. Have them find the total number of chairs needed. Discuss how each group found their answer. Compare your methods.

- B.** The chart shows the number of tickets sold for the school play each night during its run. The chart covers the years 1984–1986.

	1984	1985	1986
Monday	210	210	158
Tuesday	210	194	143
Wednesday	210	194	165
Thursday	210	194	165
Friday	210	210	200

Discuss the following questions with your group. You can use the calculator to help you find the answers.

3. In what year were the most tickets sold? **1984**
4. From the table, what do you notice about the number of tickets sold each year?  
**See margin.**
5. How did you find the totals for each year? Is there another way to compute the totals? Why or why not?  
**See margin.**
6. How can you check your answers?  
**Subtract or divide.**

Discuss multiplication and addition with your group. How are they alike? How are they different?

More Practice Set 45, page 367 **123**

## Assignment Guide

basic 1–6  
average 1–6  
enriched 1–6

**More Practice Set 45,**  
**page 367**

## Follow-Up

**Extra Practice** Give students multiplication basic facts and have them describe problem situations using these facts.

**Enrichment Calculator** Have students write an addition sentence for each of the following exercises. Have them verify that multiplication is repeated addition by using a calculator to compute the multiplication. Then have them write the multiplication sentence.

1. 4 groups of 41  $[41 + 41 + 41 + 41 = 164, 4 \times 41 = 164]$
2. 3 groups of 639  $[639 + 639 + 639 = 1,917, 3 \times 639 = 1,917]$
3. 5 groups of 28  $[28 + 28 + 28 + 28 + 28 = 140, 5 \times 28 = 140]$
4. 3 groups of 2,035  $[2,035 + 2,035 + 2,035 = 6,105, 3 \times 2,035 = 6,105]$

## Computer Assisted Instruction

Mathematics Courseware Series  
• Multiplication 1, Activity 1

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

1.  $7 + 3 + 5 + 6 + 2$  [23]
2.  $9 + 5 + 6 + 7 + 1$  [28]
3.  $4 + 7 + 1 + 2 + 6$  [20]
4.  $3 + 5 + 9 + 1 + 4$  [22]
5.  $8 + 6 + 4 + 2 + 5$  [25]

## Enrichment 45

Name \_\_\_\_\_

**How Many in the Box?** E45

Tell how many cans are in each box.

1. **16 cans**
2. **24 cans**
3. **35 cans**
4. **30 cans**
5. **32 cans**
6. **50 cans**
7. **72 cans**
8. **112 cans**

## Additional Resource 45

Give different ways to find the number of postcards.

### Math Poster N Meaning of Multiplication

Different ways to find the number of postcards would be to count them to find there are 20, to use the repeated addition sentence  $5 + 5 + 5 + 5 = 20$ , and to use the multiplication sentence  $4 \times 5 = 20$ . See Answer Key for teaching ideas related to this poster.

### Answers, page 123

4. In 1984, the same number of tickets was sold each night. In 1985, the same number of tickets was sold on Monday and Friday, and the same number on Tuesday, Wednesday, and Thursday. In 1986, the same number of tickets was sold on two nights; on the rest of the nights, sales differed.
5. Students can multiply or add for 1984, and can either add or combine addition and multiplication for 1985 and 1986.



## Objective 46

Write products for multiplication facts using 2 or 3 as factors.

### Lesson Theme

Home Activities: Houses on a Block

### Vocabulary

Factor, product

### Materials

- Counters (Punchouts or Math Kit)
- Drawing Paper and Crayons
- Cards

## Introduction

**Using Concrete Materials** Have students arrange 12 counters into groups of 3. Ask how many groups of 3 there are. [4] Write  $4 \times 3 = 12$  on the board. Have the students arrange the 12 counters into groups of 4. Ask how many groups of 4 there are. [3] Write  $3 \times 4 = 12$  on the board. Repeat this procedure with  $6 \times 2 = 12$  and  $2 \times 6 = 12$ . Then have students display other examples of multiplication facts of 2 or 3. Stress that two factors yield the same product no matter the order.

**Warm-Up Review** Have students count by 2s until they reach 12. Then have them write addition facts to show each step of the counting process:  $2 + 2 = 4$ ,  $4 + 2 = 6$ ,  $6 + 2 = 8$ ,  $8 + 2 = 10$ ,  $10 + 2 = 12$ . Then have them count by 3s and write the corresponding addition facts.

## Using the Pages

**Teach** Have students describe what they see in the picture. Read the problem and discuss the two ways of using multiplication to describe it.

**Reading and Writing Mathematics** Introduce the terms *factor* and *product* and continue to use them, when appropriate, throughout the chapter.

In Example B, have students explain why, when the factors are the same, there is only one multiplication sentence.

**Try** Have students draw arrays for Exercises c–h. Discuss these drawings as a class.

**Practice Error Analysis** Watch for students who do not remember that two factors produce the same product regardless of the order. Have these students write pairs of multiplication sentences such as  $3 \times 9 = 27$  and  $9 \times 3 = 27$ . (See Reteaching 46.)

**Apply Problem Solving** Ask students to restate the problems in their own words.

**Multiple-step** Problem 24 is a multiple-step problem involving multiplication and subtraction.

## 2 and 3 in Multiplication

- A.** There are 5 houses on each of the 2 sides of Maple Lane. How many houses are on Maple Lane?

Think of 2 groups of 5.



$$2 \times 5 = 10$$

Factor  $\uparrow \quad \uparrow$  Product

Or, think of 5 groups of 2.



$$5 \times 2 = 10$$

There are 10 houses on Maple Lane.

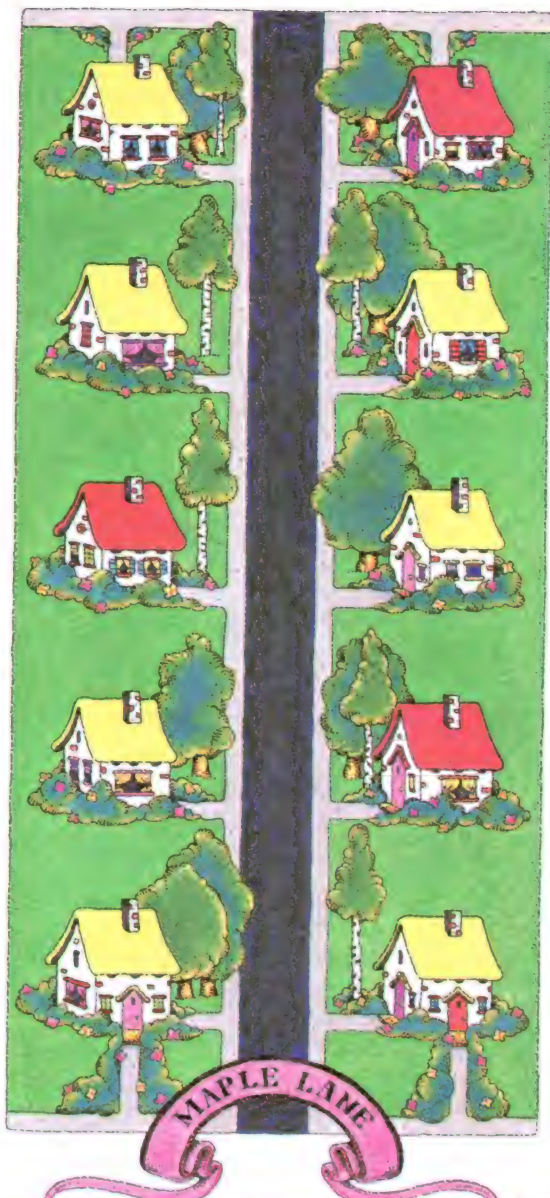
- B.** Find  $3 \times 3$ .

Think of 3 groups of 3.



$$3 \times 3 = 9$$

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## Practice 46

Name: \_\_\_\_\_

What do you call a train with a cold?

To find out, connect each exercise with its answer. The line will pass through a letter. Write that letter in the box with its exercise number. Two answers are used twice.

1.  $2 \times 3 =$  \_\_\_\_\_ A \_\_\_\_\_

2.  $2 \times 7 =$  \_\_\_\_\_ E \_\_\_\_\_

3.  $3 \times 8 =$  \_\_\_\_\_ H \_\_\_\_\_

4.  $4 \times 3 =$  \_\_\_\_\_ B \_\_\_\_\_

5.  $7 \times 3 =$  \_\_\_\_\_ G \_\_\_\_\_

6.  $2 \times 4 =$  \_\_\_\_\_ C \_\_\_\_\_

7.  $9 \times 3 =$  \_\_\_\_\_ S \_\_\_\_\_

8.  $6 \times 2 =$  \_\_\_\_\_ Q \_\_\_\_\_

9.  $2 \times 6 =$  \_\_\_\_\_ O \_\_\_\_\_

10.  $2 \times 2 =$  \_\_\_\_\_ T \_\_\_\_\_

11.  $3 \times 5 =$  \_\_\_\_\_ W \_\_\_\_\_

12.  $9 \times 2 =$  \_\_\_\_\_ A \_\_\_\_\_

13.  $5 \times 2 =$  \_\_\_\_\_ D \_\_\_\_\_

14.  $3 \times 3 =$  \_\_\_\_\_ I \_\_\_\_\_

15.  $6 \times 3 =$  \_\_\_\_\_ N \_\_\_\_\_

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**Try** Copy and complete the multiplication sentence for each picture.

a.   
 $2 \times 4 = 8$

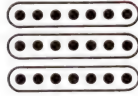
b.   
 $3 \times 2 = 6$

Multiply.

- c.  $2 \times 2 = 4$     d.  $4 \times 3 = 12$     e.  $2 \times 6 = 12$     f.  $3 \times 5 = 15$     g.  $6 \times 3 = 18$     h.  $7 \times 2 = 14$

**Practice** Copy and complete the multiplication sentence for each picture.

1.   
 $6 \times 2 = 12$

2.   
 $3 \times 7 = 21$

Multiply.

3.  $5 \times 2 = 10$     4.  $2 \times 7 = 14$     5.  $7 \times 3 = 21$     6.  $8 \times 3 = 24$     7.  $2 \times 3 = 6$     8.  $2 \times 5 = 10$   
 9.  $9 \times 3 = 27$     10.  $2 \times 9 = 18$     11.  $3 \times 6 = 18$     12.  $4 \times 2 = 8$     13.  $5 \times 3 = 15$     14.  $3 \times 7 = 21$   
 15.  $9 \times 2 = 18$     16.  $3 \times 8 = 24$     17.  $3 \times 9 = 27$     18.  $8 \times 2 = 16$     19.  $3 \times 3 = 9$     20.  $2 \times 8 = 16$

**Apply** Solve each problem.

21. The 2 sides of Maple Lane are lined with trees. There are 7 trees on each side. How many trees are on Maple Lane?  
**14 trees**
22. Each of the 4 corner houses on Maple Lane has 2 sidewalks. How many sidewalks do the corner houses have in all?  
**8 sidewalks**
23. Of the 10 houses on Maple Lane, 3 houses have red roofs. How many houses on Maple Lane do not have red roofs?  
**7 houses**
24. On each of the 2 sides of Maple Lane, 3 of the trees are birch trees, and 4 are maple trees. How many more maple trees than birch trees are on Maple Lane?  
**2 more maple trees**
25. **Calculator** Press:  $3 \times 9 =$ .  
 What happened on your calculator?  
**Most calculators will add.**

More Practice Set 46, page 368 125

## Assignment Guide

basic 1–22, 25  
 average 1–23, 25  
 enriched 1–25

**More Practice Set 46,**  
 page 368

## Follow-Up

**Reteaching** Have students make a file for the multiplication facts for 2 and 3. Each card should have the factors on one side and the product on the other. Students may test themselves or work in pairs. As they master a fact, that card may be removed from their file.

**Enrichment Make a table** Give students the following problem: Joe and Jill doubled the amount of money they earned each day for 10 days. If Joe made 2¢ and Jill made 3¢ the first day, how much more than Joe did Jill make on the fifth day? [16¢] the tenth day? [512¢] How much had each earned by the tenth day? [Joe, 2,046¢; Jill, 3,069¢] How much more had Jill earned than Joe? [1,023¢] Students could make a chart similar to the one started below.

Day	Joe	Jill
1	2	3
2	4	6

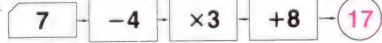
Day	Joe	Jill
3	8	12
4	16	24

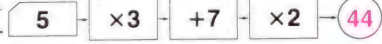
## Enrichment 46


Name \_\_\_\_\_ E46

**Flow Charts III**

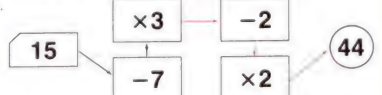
Follow the flow charts below.  
 Write the final output in the circle.


1. 

2. 

3. 

Draw the missing arrows in the following flow charts so the final output is correct.

4. 

5. 

## Additional Resource 46

Name \_\_\_\_\_ Additional Resource 46

**Maintenance**

Write the hundreds digit

1. 5,234 2    2. 457,683 6    3. 1,257,649 6

Write the thousands digit

4. 5,234 5    5. 497,653 7    6. 1,257,649 7

Write the number that is 1,000 greater

7. 45,786 46,786    8. 895 1,895

9. 3,408,275 3,409,275    10. 91,256 92,256

11. 2,453,825 2,454,825    12. 1,576 2,576

Write each number in standard form

13. two thousand, seven 2,007

14. three million, eight 3,000,008

15. three million, eight hundred-thousand 3,800,000

16. six hundred forty-seven thousand 647,000

17. eighty-seven thousand, two hundred sixty-five 87,265

18. three million, two thousand 3,002,000

19. one hundred-thousand, six 100,006

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- \$79.99 - \$34.57 [\$45.42]
- \$1.76 - \$0.98 [\$0.78]
- \$7.31 - \$5.86 [\$1.45]
- \$68.44 - \$9.79 [\$58.65]
- \$84.63 - \$59.29 [\$25.34]
- \$3.89 - \$1.23 [\$2.66]



## Objective 47

Write products for multiplication facts using 2 through 5 as factors.

### Lesson Theme

Home Activities: Shell Collecting

### Materials

- Nine toy cars
- Flashcards

## Introduction

**Using Concrete Materials** Give a student one toy car and ask how many tires the car has [4]. Write this multiplication sentence on the board  $1 \times 4 = 4$ . Give him another car and ask how many tires the two cars have [8]. Write  $2 \times 4 = 8$  on the board. Extend this activity to cover all basic facts with a factor of four. Develop the factors of five by using the fingers on one hand, two hands, and so on.

**Motivational Situation** Pose the following situation to students. Suppose you wanted to build your own display case for a shell collection. What information would you need to build it? [How many shells do you have? How many shells are of one kind? How many kinds of shells do you have?]

## Using the Pages

**Teach** Read and discuss Example A. Have students tell how to find the answer. [Counting, adding, or multiplying] Example B introduces the computational (vertical) form of writing multiplication.

In Example C, the skip counting strategy for remembering basic facts is introduced.

**Try** Have students reverse the factors in each of Exercises a–d and multiply again. Stress that the product remains the same in each exercise even though the factors are reversed.

**Practice Error Analysis** Watch for students who still need to draw pictures to do the exercises or who use addition to find the answers. Have these students practice basic facts with a partner using flashcards or basic facts files.

**Apply Problem Solving** Help students with any difficult words in the problems if necessary.

**Write a problem** Ask the students to choose one exercise from Exercises 1–33. Then have them write a problem using that fact. When students are finished, have them exchange and solve the problems.

## 4 and 5 in Multiplication

- A.** Pat built a display case for his shell collection. How many sections are in the case?



Think of 4 groups of 5.

$$4 \times 5 = 20$$

Or, think of 5 groups of 4.

$$5 \times 4 = 20$$

There are 20 sections in the display case.

- B.** You can write multiplication facts another way.

$$\begin{array}{r} 4 \leftarrow \text{Factor} \rightarrow 5 \\ \times 5 \leftarrow \text{Factor} \rightarrow \times 4 \\ \hline 20 \leftarrow \text{Product} \rightarrow 20 \end{array}$$

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## Practice 47

Name \_\_\_\_\_

What did the mouse say after he hid under the carpet?

If the answer to an exercise is not in the oval, cross out the box that contains that exercise. To answer the riddle, write the remaining letters in order in the blanks at the bottom of the page.

**1.**  $24$  **2.**  $35$  **3.**  $36$

**4.**  $40$  **5.**  $32$  **6.**  $12$

**7.**  $28$  **8.**  $16$  **9.**  $30$

**10.**  $45$  **11.**  $20$  **12.**  $15$

H A T W A S  
R U G G E D

## Reteaching 47

Name \_\_\_\_\_

**A.** Find  $6 \times 4$ . **B.** Find  $4 \times 6$

6 groups **4 in each group**

4 groups **6 in each group**

$4 + 4 + 4 + 4 + 4 + 4 = 24$   $6 + 6 + 6 + 6 = 24$

$6 \times 4 = 24$   $4 \times 6 = 24$

Multiply

**1.**  $5 + 5 + 5 = 15$  **2.**  $6 + 6 + 6 + 6 = 24$

$3 \times 5 = 15$   $5 \times 6 = 30$

**3.**  $4 \times 8 = 32$  **4.**  $4 \times 5 = 20$  **5.**  $4 \times 9 = 36$  **6.**  $4 \times 7 = 28$  **7.**  $4 \times 4 = 16$

**8.**  $5 \times 7 = 35$  **9.**  $5 \times 9 = 45$  **10.**  $5 \times 8 = 40$  **11.**  $5 \times 5 = 25$  **12.**  $5 \times 4 = 20$

**13.**  $2 \times 5 = 10$  **14.**  $5 \times 2 = 10$  **15.**  $4 \times 1 = 4$





c. Skip counting is a strategy that can help you remember a fact. **Mental Math**  
To find  $5 \times 4$ , count 4 groups of 5.

**5 , 10 , 15 , 20**  
1 group of 5    2 groups of 5    3 groups of 5    4 groups of 5

**Try** Multiply.

a.  $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$     b.  $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$     c.  $9 \times 4 = 36$     d.  $7 \times 5 = 35$

**Practice** Multiply.

1.  $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$     2.  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$     3.  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$     4.  $\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$     5.  $\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$     6.  $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$     7.  $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$   
8.  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$     9.  $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$     10.  $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$     11.  $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$     12.  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$     13.  $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$     14.  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$   
15.  $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$     16.  $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$     17.  $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$     18.  $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$     19.  $\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$     20.  $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$     21.  $\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$   
22.  $2 \times 8 = 16$     23.  $4 \times 9 = 36$     24.  $3 \times 4 = 12$     25.  $3 \times 8 = 24$     26.  $4 \times 7 = 28$     27.  $6 \times 3 = 18$   
28.  $5 \times 9 = 45$     29.  $7 \times 2 = 14$     30.  $4 \times 6 = 24$     31.  $9 \times 2 = 18$     32.  $5 \times 4 = 20$     33.  $3 \times 3 = 9$

**Apply** Solve each problem.

34. Pat has 4 shells in each of the 4 corner sections. How many shells are in the corner sections?  
**16 shells**
35. In each of 2 sections of the case, there are 5 turban shells. How many turban shells are in these sections?  
**10 turban shells**
36. Pat has 6 tiger cowrie shells in his case. If he places 5 more in the case, how many tiger cowrie shells will there be in Pat's case?  
**11 tiger cowrie shells**
37. Pat has 2 moon shells in each of the 4 sections in the third row. How many moon shells are there in the third row?  
**8 moon shells**
38. **Calculator** Press:  $3 \times 4 = = = = =$ .  
What does the display show? What happened on your calculator?  
**Calculators with automatic constant will do repeated multiplication.**

More Practice Set 47, page 368 **127**

## Assignment Guide

basic 1–14, 28–35, 38  
average 1–36, 38  
enriched 1–38

**More Practice Set 47,**  
page 368

## Follow-Up

**Reteaching** Have students draw 5 dots in each of 2 rows to make an array. Then have them write the multiplication fact to go with it. [ $2 \times 5 = 10$ ] Have students draw other arrays and write a multiplication fact for each array.

**Enrichment Write a problem** Give each student a piece of paper on which you have written several basic facts using 2 through 5 as factors. Have students write a multiple-step word problem involving the fact and either addition or subtraction. Then have students exchange papers and solve each problem.

## Computer Assisted Instruction

Mathematics Courseware Series

- Multiplication 1, Activity 2

## Enrichment 47

Name \_\_\_\_\_ E47

**What Next?**

Complete this multiplication table.

$\times$	2	5	3	4	7	6
4	8		12	16	28	24
2	4	10	6	8	14	12
5	10	25	15	20	35	30
3	6	15	9	12	21	18

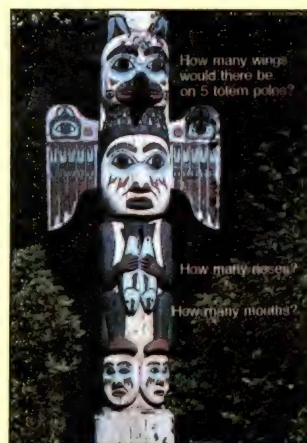
Fill in all the missing numbers and complete these multiplication tables.

$\times$	7	2	9	8	3	5	6	4
2	14	4	18	16	6	10	12	8
5	35	10	45	40	15	25	30	20
4	28	8	36	32	12	20	24	16
3	21	6	27	24	9	15	18	12

$\times$	4	5	6	9	7	8	3	2
2	8	10	12	18	14	16	6	4
4	16	20	24	36	28	32	12	8
3	12	15	18	27	21	24	9	6
5	20	25	30	45	35	40	15	10

What number has to go here?

## Additional Resource 47



### Math Poster O Applying Multiplication

There would be  $5 \times 2$ , or 10, wings on 5 totem poles. Answers may vary for other questions. See Answer Key for other answers.

## Daily Maintenance

**Estimation** Choose the most sensible measure.

- Length of a parakeet  
6 in. 6 ft. 6 mi. [6 in.]
- Height of a fourth-grade boy  
4 in. 4 ft. 4 yd. [4 ft.]
- Length of a baseball bat  
1 in. 1 ft. 1 yd. [1 yd.]
- Distance a car travels in an hour  
55 ft. 55 yd. 55 mi. [55 mi.]
- Length of a window curtain  
2 in. 2 yd. 2 mi. [2 yd.]



## Objective 48

Write products for multiplication facts using 2 through 6 as factors.

### Lesson Theme

Careers: Baker

### Materials

- Hexagon pattern blocks (Math Kit)
- Toothpicks

## Introduction

**Using Concrete Materials** Divide the class into groups and give each group a set of nine hexagons from the pattern blocks. Ask how many sides one figure has. [6] Write  $1 \times 6 = 6$  on the board. Ask how many sides are on two figures. [12] Write on the board  $2 \times 6 = 12$ . Have each group of students continue this pattern through  $6 \times 9 = 54$ .

**Motivational Situation** Pose the following situation to students. Suppose you were a baker. In what ways would mathematics help you perform your job? [Counting inventory, computing sales, counting change.]

## Using the Pages

**Teach** In Example A, have students count by 3s to 60. Write the list on the board. Then have students count by 6s by omitting all the odd-numbered multiples of 3. Then write a basic fact with 6 as a factor for each number in the list.

In Example B, students are introduced to the doubling strategy for recalling basic facts.

**Apply Problem Solving** Encourage students to check their answers for accuracy.

**Multiple-Step** Problem 36 is a multiple-step problem involving multiplication and addition.

**Use physical models** For Problem 38, divide students into small groups and distribute 14 toothpicks to each group. Have students arrange the toothpicks as shown. Then have them work together to solve the puzzle.

### Answers, pages 128–129

- a. 48 b. 36 c. 54 d. 18  
e. 12 f. 30

1. 24 2. 12 3. 48 4. 18  
5. 24 6. 54 7. 42 8. 18  
9. 12 10. 30 11. 12 12. 36  
13. 48 14. 40 15. 24 16. 27  
17. 54 18. 12 19. 42 20. 16  
21. 30 22. 14 23. 36 24. 24  
25. 54 26. 35 27. 18 28. 30  
29. 36 30. 48 31. 18 32. 42  
33. 24 muffins 34. 8 loaves  
35. No; he will have only 30 loaves.  
36. 23 rolls

## 6 in Multiplication

**Career** Alan Johnson is a baker. When he bakes biscuits, he places 6 biscuits in a row and fits 7 rows on a pan. How many biscuits does he put on each pan?

- A. Think of 7 groups of 6.

$$7 \times 6 = 42$$



- B. Use doubling to remember a fact.

$$3 \text{ sevens} = 21$$

$$3 \text{ sevens} = 21$$

$$6 \text{ sevens} = 42$$

He puts 42 biscuits on each pan.

Try Multiply.

$$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$$

$$d. 6 \times 3$$

$$e. 2 \times 6$$

$$f. 6 \times 5$$



## Practice 48

Name \_\_\_\_\_

Multiply.

1.  $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$  2.  $\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$  3.  $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$  4.  $\begin{array}{r} 0 \\ \times 6 \\ \hline \end{array}$

5.  $\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$  6.  $\begin{array}{r} 1 \\ \times 6 \\ \hline \end{array}$  7.  $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$  8.  $\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$

9.  $\begin{array}{r} 6 \\ \times 1 \\ \hline \end{array}$  10.  $\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$  11.  $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$  12.  $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$

13. Multiply to complete the circle.

Solve the problem.

14. Maria collects stamps. She has 6 pages of stamps. Each page has 7 stamps. How many stamps does Maria have in all? 42 stamps

## Reteaching 48

Name \_\_\_\_\_

A. Find  $6 \times 7$ .

6 groups  
7 in each group

B. Find  $7 \times 6$ .

7 groups  
6 in each group

$7 \times 7 = 49$   $7 \times 6 = 42$   $6 \times 6 = 36$   $6 \times 5 = 30$   $6 \times 4 = 24$   $6 \times 3 = 18$   $6 \times 2 = 12$   $6 \times 1 = 6$

Write two multiplication sentences for each exercise.

1.  $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$   $8 \times 6 = 48$

2.  $\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$   $9 \times 6 = 54$

Multiply.

3.  $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$  4.  $\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$  5.  $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$  6.  $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$  7.  $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$

8.  $6 \times 1 = 6$  9.  $1 \times 6 = 6$  10.  $6 \times 5 = 30$



## Assignment Guide

basic	1–26, 33–34, 37–38
average	1–38
enriched	1–38

**More Practice Set 48,**  
page 368

## Follow-Up

**Extra Practice** *Mental Math* Divide students into two teams to play *Fact Baseball*. Each batter is given a multiplication fact to answer in 3 seconds. If the correct answer is given in the time allowed, the batter advances to first base. Subsequent batters continue to play, each advancing one base at a time. Each time a batter reaches home, a point is scored for the team. After 3 outs (incorrect answers), the other team comes to bat and play continues for 3 to 9 innings. The team with the most runs at the end is the winner.

**Reteaching** The students should continue to use and update their multiplication basic-facts file.

## Calculator

**Choosing a Computation Method** Have students choose whether to solve these puzzles using a calculator, pencil and paper, or mental math.

- 5 times 6, minus 27, times 9, minus 25, times 8. [16]
- 9 times 4, plus 6, minus 36, times 7, plus 7. [49]
- 3 times 7, minus 15, times 2, minus 9, times 8. [24]

## Cooperative Learning Groups

See page 478 of this Teacher's Edition.

## Daily Maintenance

List numbers in order from greatest to least.

- 7 4 18 [18, 7, 4]
- 11 29 9 [29, 11, 9]
- 27 35 18 [35, 27, 18]
- 38 34 42 40 [42, 40, 38, 34]
- 66 83 20 51 [83, 66, 51, 20]
- 96 73 16 65 [96, 73, 65, 16]

## Answers, continued

37. 12; 18; 30; 48; 6 is multiplied by 2, 3, 5, and 8.

38.



## Practice Multiply

- $4 \times 6$
- $6 \times 2$
- $8 \times 6$
- $3 \times 6$
- $8 \times 3$
- $9 \times 6$
- $6 \times 7$
- $6 \times 3$
- $4 \times 3$
- $5 \times 6$
- $2 \times 6$
- $6 \times 6$
- $6 \times 8$
- $5 \times 8$
- $6 \times 4$
- $3 \times 9$
- $9 \times 6$
- $6 \times 2$
- $6 \times 7$
- $2 \times 8$
- $5 \times 6$
- $7 \times 2$
- $6 \times 6$
- $4 \times 6$
- $6 \times 9$
- $5 \times 7$
- $2 \times 9$
- $6 \times 5$
- $9 \times 4$
- $6 \times 8$
- $3 \times 6$
- $7 \times 6$

## Apply Solve each problem.

- When baking muffins, Alan uses pans that have 6 rows with 4 muffins in each row. How many muffins are in each pan?
- Alan needs to make 100 loaves of bread. If he makes 6 batches of rye bread with 5 loaves in each batch, will he have enough loaves? Why or why not?
- The bakery had 24 loaves of whole wheat bread when it opened in the morning. By noon 16 loaves were sold. How many loaves were left?
- Alan made a pan of dinner rolls. There were 5 dinner rolls in each of 4 rows and another row of 3 dinner rolls. How many dinner rolls did he make?

- Calculator** Press: 6  $\square$  2  $\square$  3  $\square$  5  $\square$  8  $\square$  Explain your displays.

- Remove 4 toothpicks to make 4 triangles that are the same size.



More Practice Set 48, page 368 129

## Enrichment 48

Name \_\_\_\_\_ E48

**Some Special Properties**

You can use basic facts to multiply 2-digit numbers.

$4 \times 13$  I don't know this.

$4 \times 13 = (4 \times 6) + (4 \times 7)$   
I know both  $4 \times 6$  and  $4 \times 7$ .  
 $4 \times 13 = 24 + 28 = 52$

Use basic facts to find these products.

- $4 \times 15 = (4 \times 9) + (4 \times 6)$   
 $36 + 24 = 60$
- $3 \times 12 = (3 \times 6) + (3 \times 6)$   
 $18 + 18 = 36$
- $5 \times 14 = (5 \times 7) + (5 \times 7)$   
 $35 + 35 = 70$
- $4 \times 11 = (4 \times 6) + (4 \times 5)$   
 $24 + 20 = 44$
- $6 \times 17 = (6 \times 9) + (6 \times 8)$   
 $54 + 48 = 102$
- $3 \times 16 = (3 \times 8) + (3 \times 8)$   
 $24 + 24 = 48$

Find each of the following products by thinking of the 2-digit number as the sum of two 1-digit numbers. *Answers will vary.*

- $7 \times 12 = (5 \times \square) + (5 \times \square)$   
 $30 + 30 = 60$
- $8 \times 11 = (3 \times \square) + (3 \times \square)$   
 $18 + 15 = 33$
- $9 \times 14 = (6 \times \square) + (6 \times \square)$   
 $42 + 42 = 84$
- $4 \times 17 = (4 \times \square) + (4 \times \square)$   
 $36 + 32 = 68$
- $6 \times 18 = (6 \times \square) + (6 \times \square)$   
 $54 + 54 = 108$

## Additional Resource 48

Name \_\_\_\_\_ Additional Resource 48

**Computer BASIC: Multiplication**

The computer uses the symbol \* to show multiplication. BASIC language tells the computer \* means multiplication and that X means the letter X.

You can use PRINT without quotation marks to do multiplication.

Type each of these instructions. Write the outputs.

- PRINT 6\*4  $\underline{24}$
- PRINT 3\*8  $\underline{24}$
- PRINT 0\*7  $\underline{0}$
- PRINT 5\*1  $\underline{5}$

A semicolon (;) at the end of a PRINT statement tells the computer to put the output from the next PRINT statement on the same line.

Type these programs. Type RUN. Write the output.

- 10 PRINT "I CAN ";  
20 PRINT "DO MATH ON ";  
30 PRINT "A COMPUTER."  
40 END
- 10 PRINT "THE PRODUCT";  
20 PRINT "OF 6 \* 8 IS ";  
30 PRINT 6\*8  
40 END

LOAD SIMULATION A COMPUTER THE PRODUCT OF 6 \* 8 IS 48

Use the NEW command to erase an old program from memory before typing a new program.

Type NEW. Then enter and run this program. Show the output.

- 10 PRINT "2\*2=";  
20 PRINT "3\*3=";  
30 PRINT 3\*3  
40 END

Type NEW and see what the output is for LIST.



## Using Problem-Solving Strategies

- Draw a picture.
- Use physical models.
- Find a pattern.
- Make a table.

### Materials

- Chips or other counters

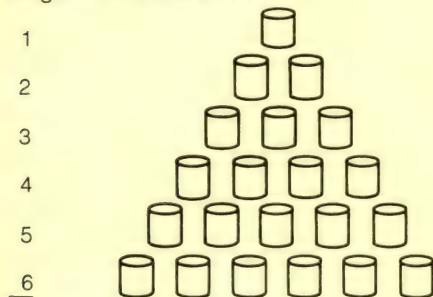
### Introduction

Many students will draw a diagram to solve the first problem. As they solve the other problems, they notice patterns and use them to solve the remaining problems.

### Using the Pages

Encourage each group of students to discuss how they plan to solve the problem and to use more than one method if different members of the group have different ideas.

Students might begin by *drawing a diagram* of 6 rows of cans.



21 cans

Others may wish to use *physical models*, such as chips or other counters, to represent the 6 rows of cans. Students then add the numbers of cans that they have drawn or shown with chips.

After each group has solved the problem, have one or more members of each group write their solution on the board and explain the method used to solve the problem. Compare the methods used by the different groups. Have students discuss why they like a particular method. Be sure that students realize that there is no one best method to use. You might say, "If a method makes sense to you and solves the problem, it is a good method."

After discussing the different methods, have students choose a method to solve Problems 5 through 7.

For Problem 5, if Jose used 8 rows to stack his cans, he had 36 cans.

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36$$

Students may recognize that they can use the answer to Problem 5 to help them solve Problem 6. By adding rows 9 through 12 to the result of Problem 5, they will have the answer to Problem 6.

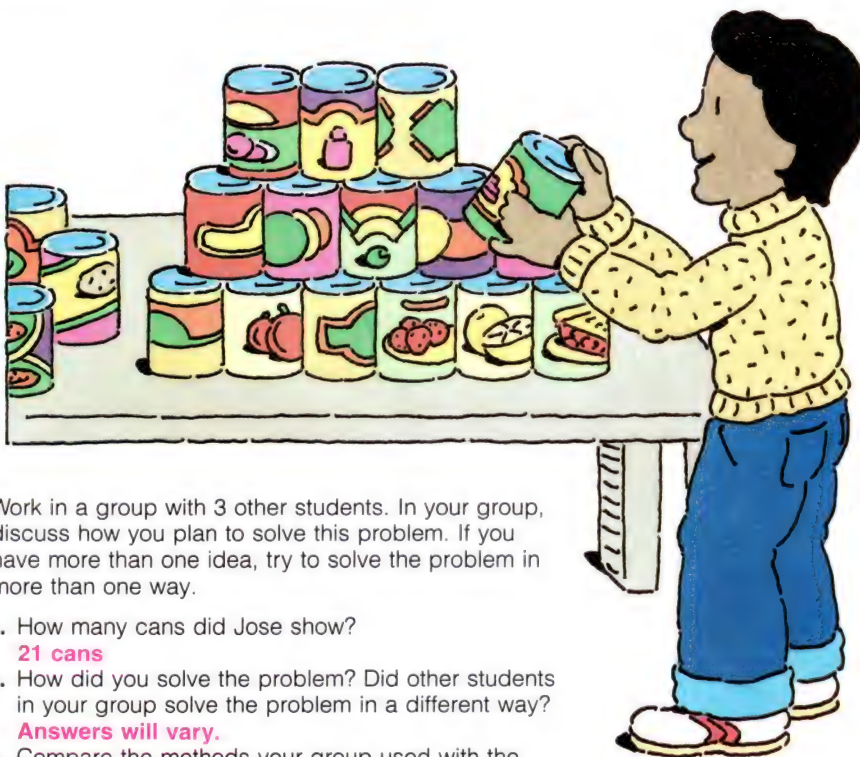
$$36 + 9 + 10 + 11 + 12 = 78$$

(Continued on page 131.)

## Using Problem-Solving Strategies

# STACKS AND STACKS OF CANS

Jose brought his can collection to show his class. He displayed the cans by stacking them in the shape of a triangle. On the top of the stack was 1 can. On the next row down were 2 cans. The third row had 3 cans. If Jose used 6 rows, how many cans did he show altogether?



Work in a group with 3 other students. In your group, discuss how you plan to solve this problem. If you have more than one idea, try to solve the problem in more than one way.

1. How many cans did Jose show?  
**21 cans**
2. How did you solve the problem? Did other students in your group solve the problem in a different way?  
**Answers will vary.**
3. Compare the methods your group used with the methods other groups used to solve the problem.  
**Answers will vary.**



## COMPUTER

### BASIC: Multiplication in PRINT Statements

In BASIC, the symbol \* is used for multiplication.

A semicolon at the end of a PRINT statement makes the next PRINT statement in the program print on the same line.

When this program is typed into a computer, the numbers are multiplied and the answers are printed on one line.

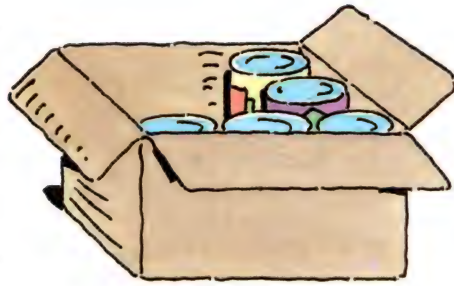
```
10 PRINT 5*6;
20 PRINT 8*9
30 END
```

This is printed.

30 72

Tell what would be printed for each program.

1. 10 PRINT 7\*8 56  
20 END
2. 10 PRINT 4\*8; 32 40  
20 PRINT 5\*8  
30 END
3. 10 PRINT 3\*6 18  
20 PRINT 0\*7 0  
30 END
4. 10 PRINT "PRODUCTS"  
20 PRINT 5\*9; PRODUCTS  
30 PRINT 2\*7 45 14  
40 END
5. 30 PRINT 6\*6 12  
10 PRINT 6+6 0 36  
40 END  
20 PRINT 6-6;



4. Which method do you like the best? Why do you like this method the best?

**Answers will vary.**

Use your favorite method or other methods to solve the following problems.

5. Jose brought some more cans to class. He stacked them in the shape of a triangle as before. This time, Jose used 8 rows. How many cans did he show now?

**36 cans**

6. Other students in Jose's class brought in more cans. They added these to Jose's stack, keeping the shape of a triangle. The cans now were stacked into 12 rows. How many cans were stacked?

**78 cans**

7. More cans were brought to class. There were now 120 cans altogether. How many rows would be needed to stack the cans in the shape of a triangle?

**15 rows**

8. Do you still like your favorite method the best? Explain your answer.

**Answers will vary.**

## Assignment Guide

basic	1-8
average	1-8
enriched	1-8

(Continued from page 130.)

Some students might make a table beginning with row 1 for Problems 1-7, while others begin with the 12th row to answer Problem 7.

Number of Rows	Number of Cans
12	78
13	91
14	105
15	120

If there are 120 cans, there will be 15 rows.

### Computer

Because the multiplication symbol might be mistaken for the letter X, \* is used to mean multiplication in BASIC.

Some microcomputers will not leave a space before the next number when a semicolon is used to cause more than one line's output to be printed on the same line. Then the example would print "3072." Check your computer for this before telling students to do these programs on a microcomputer. If the problem exists, commas can be typed in the place of the semicolons to cause the output to be separated.

Remind students to press RETURN or ENTER after each line is typed and to type NEW between programs. RUN will execute the program after it is typed in.

## Follow-Up

### Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choices.

1.  $8,921 - 6,075$  [2,846]
2.  $4 \times 7$  [28]
3.  $502 + 430$  [932]
4.  $3 \times 800$  [2,400]
5.  $600 - 298$  [302]
6.  $3,204 + 2 + 598$  [3,804]

### Daily Maintenance

1.  $689 + 724$  [1,413]
2.  $5,306 + 927$  [6,233]
3.  $496 + 1,369$  [1,865]
4.  $8,023 + 4,589$  [12,612]
5.  $9,776 + 3,516$  [13,292]



## Objective 49

Write products for multiplication facts using 0 through 6 as factors.

### Lesson Theme

School Activities: Games

### Materials

- Books
- Index cards

## Introduction

**Using Concrete Materials** Have a student place 1 book on each of 6 desks. Write  $6 \times 1 = 6$  on the chalkboard. Have another student remove the books. Say that there are no books on those 6 desks now. Write  $6 \times 0 = 0$ . Repeat, using 1 and 0 with various numbers of other objects. You may wish to have students write the multiplication sentences on the board.

## Using the Pages

**Teach** Read through the rules with students. Give this example to illustrate the rules: Suppose you pick 30 as your goal number. Then you turn over a card with a 4 on it. Multiply 4 by 3 to get 12. (See rule 4.) On your next turn, you turn over a card that has a 5 on it. Now multiply your point total, 12, by 5.  $5 \times 12 = 60$ . 60 is greater than your goal number, 30. So, on your third turn, you would need to find a way to get back to zero. After you get back to zero, you can begin again by going back to rule 4.

After students have played the game, have them discuss the questions. Have groups discuss and compare their strategies, methods, and conclusions with other groups.

Then have students answer the following questions:

1. What is the product of one and any number? [That number]
2. What is the product of zero and any number? [Zero]
3. Does  $0 \times 2$  equal  $2 \times 0$ ? [Yes]
4. Does  $1 \times 2$  equal  $2 \times 1$ ? [Yes]
5. What is  $1,193 + 0$ ? [1,193]
6. What is  $1,193 \times 0$ ? [0]
7. What is  $562 + 1$ ? [563]
8. What is  $562 \times 1$ ? [562]

## 0 and 1 in Multiplication

Play multiplication concentration!

Play the game with 3 other students. Use a calculator if you need to.

Here are the rules:

- Each group use 14 index cards. Write each of the digits 0, 1, 2, 3, 4, 5, and 6 on two cards.
- Mix the cards up. Place them in rows face down on a desk.
- Each player choose a number between 12 and 81. Announce your number to the group. This number is your *goal number* for the game. The object of the game is to reach your goal number exactly.
- Every player starts with 3 as a multiplier. Take turns selecting a card. Multiply the number on the card by 3. Write down the product. This is your score for this turn.
- Return the card to the same place. Make sure that it is face down.
- On your next turn, select a card. Multiply your present score by the number on that card. The product is your score for this turn. Return the card.
- If your point total for any turn is 0, start over.
- The first player to hit his or her goal number two times wins the game. If no player reaches his or her goal number after 10 turns, stop the game. Then have each player choose a new goal number and start the game over.



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## Practice 49

Name \_\_\_\_\_

What are the smallest rooms in the world?

If the answer to an exercise is in the oval, cross out the box that contains that exercise. To answer the question, write the remaining letters in order in the blanks at the bottom of the page.

P49

U S H R O O M S

## Reteaching 49

Name \_\_\_\_\_

R49

Each bucket has 0 frogs  
3 groups of 0 frogs  
 $3 \times 0 = 0$

Each bucket has 1 frog  
3 groups of 1 frog  
 $3 \times 1 = 3$

If I'm a factor, then I'm in the product.

Multiply

1.  $1 \times 6 = 6$  2.  $0 \times 7 = 0$  3.  $1 \times 9 = 9$   
4.  $0 \times 2 = 0$  5.  $1 \times 5 = 5$  6.  $0 \times 8 = 0$   
7.  $1 \times 1 = 1$  8.  $0 \times 4 = 0$  9.  $1 \times 0 = 0$   
10.  $0 \times 9 = 0$  11.  $1 \times 2 = 2$  12.  $0 \times 0 = 0$

Write one multiplication sentence for each picture.

13.  $2 \times 0 = 0$   
14.  $2 \times 1 = 2$   
15.  $1 \times 0 = 0$



# MAINTENANCE

After playing the game once, discuss it with your group. **See margin.**

1. What strategy did you use to get back into the game if you went over your goal number?
2. Are there any goal numbers that are impossible to reach? Why or why not?
3. What is the quickest way to hit your goal number a second time?

Play the game again. Use what you have discussed to change your strategy. Will you change your goal number? Why or why not?

Round to the nearest ten.

- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| 1. 63<br><b>60</b>   | 2. 87<br><b>90</b>   | 3. 29<br><b>30</b>   |
| 4. 284<br><b>280</b> | 5. 592<br><b>590</b> | 6. 815<br><b>820</b> |

Round to the nearest hundred.

- |                          |                           |
|--------------------------|---------------------------|
| 7. 237<br><b>200</b>     | 8. 598<br><b>600</b>      |
| 9. 7,589<br><b>7,600</b> | 10. 4,601<br><b>4,600</b> |

Round to the nearest thousand.

- |                           |                           |
|---------------------------|---------------------------|
| 11. 1,084<br><b>1,000</b> | 12. 4,138<br><b>4,000</b> |
| 13. 7,320<br><b>7,000</b> | 14. 5,652<br><b>6,000</b> |

Add or subtract.

- |  |   |  |
|--|---|--|
| 15. $\begin{array}{r} 541 \\ + 26 \\ \hline 567 \end{array}$       | 16. $\begin{array}{r} 281 \\ + 19 \\ \hline 300 \end{array}$        | 17. $\begin{array}{r} 658 \\ - 32 \\ \hline 626 \end{array}$           |
| 18. $\begin{array}{r} 823 \\ + 472 \\ \hline 1,295 \end{array}$    | 19. $\begin{array}{r} 732 \\ - 410 \\ \hline 322 \end{array}$       | 20. $\begin{array}{r} 406 \\ - 319 \\ \hline 87 \end{array}$           |
| 21. $\begin{array}{r} 631 \\ - 158 \\ \hline 473 \end{array}$      | 22. $\begin{array}{r} 590 \\ + 287 \\ \hline 877 \end{array}$       | 23. $\begin{array}{r} 900 \\ - 273 \\ \hline 627 \end{array}$          |
| 24. $\begin{array}{r} 83 \\ 94 \\ + 216 \\ \hline 393 \end{array}$ | 25. $\begin{array}{r} 72 \\ 419 \\ + 263 \\ \hline 754 \end{array}$ | 26. $\begin{array}{r} 194 \\ 639 \\ + 402 \\ \hline 1,235 \end{array}$ |
| 27. $1,640 - 799$<br><b>841</b>                                    | 28. $3,105 + 286$<br><b>3,391</b>                                   |  |
| 29. $3,000 - 420$<br><b>2,580</b>                                  | 30. $4,203 - 874$<br><b>3,329</b>                                   |  |

More Practice Set 49, page 369 **133**

## Assignment Guide

basic 1-33  
average 1-33  
enriched 1-33

More Practice Set 49,  
page 369

## Maintenance, page 133

Review with students how to round a number to the nearest ten, hundred, or thousand.

## Follow-Up

**Reteaching** Have students work at the board. Call out facts with factors of 0 and 1. Have students write the fact, draw a picture to represent it, and then give the product. Note that it is difficult to picture zero times any number. It is best to give facts involving 0 as a factor as follows:  $5 \times 0$ ,  $4 \times 0$ , and so on.

**Enrichment Write a problem** Have students write story problems for multiplication facts involving 0 or 1 as factors.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Multiplication 1, Activity 3

## Daily Maintenance

**Estimation** Would you use ounces, pounds, or tons to measure the weight of

1. a bar of soap? [Ounces]
2. an elephant? [Tons]
3. a bowling ball? [Pounds]
4. a bag of oranges? [Pounds]
5. a can of soup? [Ounces]
6. a school bus? [Tons]

## Answers, page 133

1. Students should multiply their point total by 0.
2. The numbers that are impossible to reach are all the prime numbers (numbers that have only two factors, themselves and 1) between 12 and 81. They are impossible to reach because there are no combinations of given digits that have these numbers as products.
3. The quickest way to hit your goal number a second time is to multiply it by 1.

## Enrichment 49

**Clock Multiplication** E49

Multiplication can be performed on a clock.  $3 \odot 2$  means the hand moves forward 2 spaces, 3 times.

The final location of the hand gives the answer.

$3 \odot 2 = 6$

$4 \odot 3 = 3$

Find the following clock multiplication products using the clock on the right.

1.  $5 \odot 6 =$  3

2.  $4 \odot 5 =$  2

3.  $6 \odot 2 =$  3

4.  $3 \odot 8 =$  6

5.  $3 \odot 6 =$  0

Use this new clock to find the products in Exercises 6-10.

6.  $4 \odot 5 =$  6

7.  $3 \odot 4 =$  5

8.  $5 \odot 5 =$  4

9.  $2 \odot 3 =$  6

10.  $4 \odot 4 =$  2

## Additional Resource 49

**Maintenance** Additional Resource 49

Write the numbers in order from least to greatest.

1. 783 595 95 459 95 459 783 595

2. 675 576 765 1,023 576 675 765 1,023

3. 735 2,537 3,752 3,572 735 2,537 3,572 3,752

4. 987 3,016 631 1,036 631 987 1,036 3,016

5. 4,267 7,246 5,301 6,247 4,267 5,301 6,247 7,246

6. 999 8,420 9,827 8,425 999 8,420 8,425 9,827

Compare the numbers. Use  $<$  or  $>$ .

7.  $539 < 935$  8.  $75 < 570$  9.  $4,210 < 999$

10.  $2,107 > 1,299$  11.  $5,376 > 5,349$  12.  $8,179 > 7,577$

13.  $9,542 > 9,500$  14.  $7,887 < 8,821$  15.  $5,050 < 5,051$



## Objective 50

Write products for multiplication facts using 0 through 7 as factors.

### Lesson Theme

Health: Nutrition

### Materials

- Calendars

## Introduction

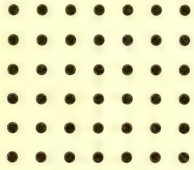
**Using Concrete Materials** Divide students into groups and give each group a calendar. Ask how many days there are in a week. [7] Then ask how students could find the number of days in 3, 4, or 5 weeks. [Multiply each number by 7.]

**Motivational Situation** Pose this situation to students. Suppose you need to buy milk for a family for one week. What would you need to consider? [How many people are in the family? How much does each person drink each day? In what size containers is the milk sold?]

## Using the Pages

**Teach** Read the example and have the students tell why multiplication is appropriate. [Each group is equal.]

Draw an array to show  $7 \times 6$ :



Ask the students for the product. [42] Add 7 dots to the array. Ask what fact this represents. [ $7 \times 7 = 49$ ] Add 7 more to represent  $7 \times 8$  and then 7 more to represent  $7 \times 9$ .

**Try** Have students point out which of the exercises they already know [a, b, e] and which are new [c, d, f].

**Practice Error Analysis** Watch for students who seem to be guessing. Have these students check some of the exercises by drawing pictures.

**Apply Problem Solving** In Problem 35, students must supply the information that 7 days equal 1 week in order to solve the problem. In Problem 36, students must know that 12 eggs equal one dozen.

**Additional problem** Have students solve the following problem. Your family doctor has recommended that each person in your family eat two eggs per week. There are 5 people in your family. How many eggs will your family eat in one week? [10 eggs]

## 7 in Multiplication

Heather read a book about good eating habits. She read that she should drink 8 glasses of water a day. How many glasses of water should she drink in 7 days?

Find  $7 \times 8$ .

Think of 7 groups of 8.



$$7 \times 8 = 56$$

Heather needs to drink 56 glasses of water in 7 days.

**Try** Multiply.

$$\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$$

$$\begin{array}{r} 7 \times 9 \\ \hline 63 \end{array}$$

$$\begin{array}{r} 7 \times 3 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 8 \times 7 \\ \hline 56 \end{array}$$



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## Practice 50

Name: \_\_\_\_\_ P50

Multiply

1. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$	2. $\begin{array}{r} 0 \\ \times 7 \\ \hline 0 \end{array}$	3. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	4. $\begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array}$
5. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$	6. $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$	7. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	8. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$
9. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$	10. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$	11. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$	12. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$

Solve each problem.

13. A group of children have 7 picnic baskets. Each basket contains 3 apples. How many apples are there in all?  
21 apples

14. A classroom has 7 windows. There are 2 snowflake designs taped to each window. How many snowflake designs are there on the windows?  
14 designs

15. A school has 7 teams for a softball league. Each team has 9 players. How many players are there in all?  
63 players

16. Esther has a coin album with 6 pages. Each page has slots for 7 coins. How many coins can she put in the album?  
42 coins

## Reteaching 50

Name: \_\_\_\_\_ R50

A. Find  $7 \times 8$

$8 + 8 + 8 + 8 + 8 + 8 + 8 = 56$      $7 + 7 + 7 + 7 + 7 + 7 + 7 = 56$

7 groups of 8  
 $7 \times 8 = 56$

8 groups of 7  
 $8 \times 7 = 56$

What has teeth but doesn't eat?

Multiply. Match each letter to its answer in the blanks.

1. $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$ S	2. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$ B	3. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$ C	4. $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$ M	5. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$ O
C	O	M	B	S

6. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ S	7. $\begin{array}{r} 0 \\ \times 7 \\ \hline 0 \end{array}$ R	8. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ A	9. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$ G	10. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$ E
G	E	A	R	S



## Practice Multiply.

$$\begin{array}{r} 1. \quad 2 \\ \times 7 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 2. \quad 9 \\ \times 7 \\ \hline 63 \end{array}$$

$$\begin{array}{r} 3. \quad 7 \\ \times 4 \\ \hline 28 \end{array}$$

$$\begin{array}{r} 4. \quad 7 \\ \times 7 \\ \hline 49 \end{array}$$

$$\begin{array}{r} 5. \quad 6 \\ \times 7 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 6. \quad 4 \\ \times 4 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 7. \quad 8 \\ \times 6 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 8. \quad 0 \\ \times 7 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 9. \quad 9 \\ \times 6 \\ \hline 54 \end{array}$$

$$\begin{array}{r} 10. \quad 7 \\ \times 6 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 11. \quad 5 \\ \times 7 \\ \hline 35 \end{array}$$

$$\begin{array}{r} 12. \quad 7 \\ \times 2 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 13. \quad 4 \\ \times 6 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 14. \quad 8 \\ \times 7 \\ \hline 56 \end{array}$$

$$15. \quad 5 \times 6 \\ 30$$

$$16. \quad 1 \times 7 \\ 7$$

$$17. \quad 7 \times 8 \\ 56$$

$$18. \quad 7 \times 0 \\ 0$$

$$19. \quad 9 \times 3 \\ 27$$

$$20. \quad 7 \times 1 \\ 7$$

$$21. \quad 7 \times 3 \\ 21$$

$$22. \quad 4 \times 5 \\ 20$$

$$23. \quad 7 \times 5 \\ 35$$

$$24. \quad 5 \times 5 \\ 25$$

$$25. \quad 3 \times 7 \\ 21$$

$$26. \quad 7 \times 9 \\ 63$$

$$27. \quad 4 \times 7 \\ 28$$

$$28. \quad 6 \times 7 \\ 42$$

$$29. \quad 9 \times 4 \\ 36$$

$$30. \quad 4 \times 6 \\ 24$$

$$31. \quad 8 \times 7 \\ 56$$

$$32. \quad 7 \times 6 \\ 42$$

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used.

33. Heather eats 3 slices of bread each day. Is a 24-slice loaf enough bread for 7 days?

**Yes; M**

34. Heather ate 3 servings of vegetables a day for a week. How many servings of vegetables did she eat in those 7 days?

**21 servings; M**

35. Heather eats 2 servings of protein each day. Does she eat enough protein if she should be eating 15 servings a week?

**No; M**

36. How many eggs in all are there in 7 dozen eggs?

**84 eggs; C**

## Assignment Guide

basic 1–36

average 1–36

enriched 1–36

**More Practice Set 50,**  
**page 369**

## Follow-Up

**Reteaching** The students should update their multiplication basic-facts files to include all facts 0–7.

**Enrichment** *Find a pattern* Have students fill in the missing numbers in the following charts.

X	[6]	[8]	[7]	[4]
[3]	18	[24]	[21]	[12]
[1]	6	[8]	7	[4]
[2]	[12]	16	[14]	8
[5]	[30]	[40]	35	20

X	[1]	[6]	[2]	[4]
[7]	[7]	42	14	[28]
[8]	8	[48]	[16]	[32]
[3]	[3]	18	[6]	12
[9]	9	[54]	18	[36]

When students have finished filling in the charts, you may wish to ask students what rule could be used to pair the entries in column 1 (excluding the first row) with the entries in column 2. [Multiply by 6] Then ask what rule could be used to pair the entries in column 1 with the entries in column 3. [Multiply by 8] Repeat until you have discussed all the columns in both charts.

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- |                 |                 |
|-----------------|-----------------|
| 1. $8 - 7$ [1]  | 2. $7 - 3$ [4]  |
| 3. $16 - 9$ [7] | 4. $12 - 9$ [3] |
| 5. $9 - 4$ [5]  | 6. $13 - 5$ [8] |

## Enrichment 50

Name \_\_\_\_\_ E50

**Sums and Products**

Find a pair of numbers on the right that have the sum and product given on the left. Write the letter for the pair on the blank next to the exercise. You will find a message.

1. Sum 4, product 3	<u>Y</u>	7. 7	O
2. Sum 14, product 49	<u>O</u>	7. 4	C
3. Sum 12, product 36	<u>U</u>	4. 0	L
4. Sum 9, product 14	<u>C</u>	5. 3	L
5. Sum 6, product 8	<u>A</u>	2. 2	E
6. Sum 13, product 42	<u>N</u>	3. 1	Y
7. Sum 11, product 28	<u>C</u>	4. 2	A
8. Sum 7, product 6	<u>A</u>	5. 5	C
9. Sum 4, product 0	<u>L</u>	3. 0	A
10. Sum 10, product 25	<u>C</u>	5. 2	T
11. Sum 12, product 35	<u>U</u>	6. 6	U
12. Sum 8, product 15	<u>L</u>	6. 7	N
13. Sum 3, product 0	<u>A</u>	7. 2	C
14. Sum 7, product 10	<u>T</u>	6. 1	A
15. Sum 4, product 4	<u>E</u>	7. 5	U

## Additional Resource 50

Name \_\_\_\_\_ Additional Resource 50

**Maintenance**

Add or subtract

1. $8 + 6 =$ <u>14</u>	2. $8 - 6 =$ <u>2</u>	3. $9 + 5 =$ <u>14</u>
4. $5 + 8 =$ <u>13</u>	5. $14 - 5 =$ <u>9</u>	6. $11 - 8 =$ <u>3</u>
7. $18 - 9 =$ <u>9</u>	8. $6 + 7 =$ <u>13</u>	9. $6 + 6 =$ <u>12</u>
10. $14 - 8 =$ <u>6</u>	11. $5 + 5 =$ <u>10</u>	12. $11 - 3 =$ <u>8</u>
13. $12 - 6 =$ <u>6</u>	14. $11 - 4 =$ <u>7</u>	15. $9 + 7 =$ <u>16</u>
16. $15 - 6 =$ <u>9</u>	17. $7 + 7 =$ <u>14</u>	18. $8 + 4 =$ <u>12</u>
19. $9 - 0 =$ <u>9</u>	20. $13 - 6 =$ <u>7</u>	21. $6 + 8 =$ <u>14</u>
22. $8 + 8 =$ <u>16</u>	23. $12 - 5 =$ <u>7</u>	24. $11 - 5 =$ <u>6</u>
25. $15 - 9 =$ <u>6</u>	26. $13 - 9 =$ <u>4</u>	27. $9 + 4 =$ <u>13</u>
28. $0 + 8 =$ <u>8</u>	29. $6 + 4 =$ <u>10</u>	30. $3 + 7 =$ <u>10</u>
31. $12 - 9 =$ <u>3</u>	32. $0 - 0 =$ <u>0</u>	33. $9 + 9 =$ <u>18</u>
34. $17 - 9 =$ <u>8</u>	35. $16 - 8 =$ <u>8</u>	36. $7 + 8 =$ <u>15</u>
37. $7 + 6 =$ <u>13</u>	38. $17 - 8 =$ <u>9</u>	39. $16 - 9 =$ <u>7</u>



## Objective 51

Write products for multiplication facts using 0 through 8 as factors.

### Lesson Theme

Consumer Topics: Buying Food

### Materials

- Counters (Punchouts or Math Kit)
- Flashcards for factors of 8

## Introduction

**Using Concrete Materials** Have one student display eight counters and write the multiplication sentence  $1 \times 8 = 8$  on the board. Then have a student display a second set of eight counters and write  $2 \times 8 = 16$ . Repeat this activity adding one group of eight each time.

**Motivational Situation** Pose the following situation to students. Suppose you had to order tickets to a concert for members of your club and their guests. What information would you need? [How many members wish to attend? How many will be bringing a guest? How much does each ticket cost?]

## Using the Pages

**Teach** Read the examples with the class. Have students tell the two new facts they need to learn. [ $8 \times 8$  and  $8 \times 9$ ] Have the students write the other facts of 8.

In Example B, students are shown how to use a fact they know to help them recall the product for a troublesome fact.

**Practice** After students work these exercises, drill the basic facts of 8 by dividing the class into two lines facing the chalkboard. Show a flashcard to the first members of each line and have them write the answer on the board. The first student with the correct answer wins one point for that team. Repeat until all students have had several turns.

**Apply Problem Solving** Encourage students to discuss how they solve the problems. Remind students to label their answers.

**Multiple-Step** Give the following problem to the students. Steve bought 5 marbles. After Karen gave 3 of her marbles to Steve, she had 3 times as many as he did. How many marbles did Steve have? [8] How many did Karen have? [24]

## 8 in Multiplication

Jeffrey bought 9 ears of corn at the vegetable stand. Each ear of corn cost 8¢. How much did Jeffrey spend for the corn?

- a. Think of 9 groups of 8.

$$9 \times 8 = 72$$

- b. Use a product you know to remember a fact. To find  $9 \times 8$ , think of  $8 \times 8$  plus one more 8.

$$9 \times 8 = 72 \quad (64 + 8)$$



Mental Math

Jeffrey spent 72¢ for the corn.

**Try** Multiply.

$$\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$$

$$\begin{array}{r} 8 \times 6 \\ 48 \end{array}$$

$$\begin{array}{r} 8 \times 8 \\ 64 \end{array}$$

**Practice** Multiply.

$$\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$$

$$\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$$

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## Practice 51

Name \_\_\_\_\_

Multiply

1. $\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$	2. $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$	3. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$	4. $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$
5. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$	6. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	7. $\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$	8. $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$
9. $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$	10. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$	11. $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$	12. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$

What kind of saw has no teeth?

To find out, connect each exercise with its answer. The line will pass through a letter. Write that letter in the blank beside the answer.

13. $8 \times 4$	24	A
14. $3 \times 8$	40	S
15. $1 \times 8$	72	E
16. $5 \times 8$	16	E
17. $9 \times 8$	8	S
18. $2 \times 8$	32	A
19. $8 \times 7$	56	W

## Reteaching 51

Name \_\_\_\_\_

This picture shows two multiplication facts.

5 groups of 8 drums  
 $5 \times 8 = 40$

8 groups of 5 drums  
 $8 \times 5 = 40$

What goes through water but doesn't get wet?

Multiply. Cross off the letter to the right of each answer.

1. $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$	2. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$	3. $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$	4. $\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$
5. $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$	6. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$	7. $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$	8. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$
9. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$	10. $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$	11. $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$	12. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$
13. $\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$	14. $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$	15. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	16. $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$

32	X
48	T
42	S
0	H
8	I
25	U
16	S
24	E
40	G
14	N
32	I
64	A
0	A
49	S
24	M
16	H
35	H
21	I
8	E
40	T
28	N
48	D
30	E
56	T



## Assignment Guide

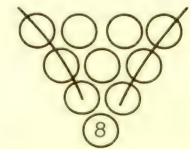
basic	1-41
average	1-41
enriched	1-41

**More Practice Set 51,**  
page 369

**Homework to do with others** With the help of another person, ask each student to plan a meal for a camp out. Using a newspaper ad or a visit to a food store, have each student find out how much it would cost to serve this meal. Tell each student to bring a list of items and costs to class.

## Follow-Up

**Extra Practice *Mental Math*** Have students play *Multiples of 8*. The students should draw circles as shown with the circle at the bottom of the drawing labeled 8. As you call out 0, 16, 24, 32, 40, 48, 56, 64, and 72 have students write the numbers in any order they wish on the other circles. Now call out any multiplication fact of 8. The students shade in the circle with its product. Continue in this fashion until one student has shaded in the 6 circles indicated by the lines in the drawing. This student is the winner.



**Reteaching** Have students make arrays for the multiplication facts of 8.

## Daily Maintenance

**Estimation** Choose the most sensible measure.

- Length of a dinner fork.  
20 cm 20 m 20 km [20 cm]
- Length of a whale.  
22 cm 22 dm 22 m [22 m]
- Distance from home to library.  
2 cm 2 dm 2 km [2 km]
- Height of a table  
8 dm 8 m 8 km [8 dm]
- Length of a hammer.  
3 cm 3 dm 3 m [3 dm]

**Using Problem-Solving Strategies,** page 418

- $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$
- $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$
- $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$
- $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$
- $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$
- $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$
- $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$
- $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$
- $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$
- $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$
- $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$
- $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$
- $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$
- $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$
- $0 \times 8 = 0$
- $8 \times 5 = 40$
- $8 \times 2 = 16$
- $3 \times 9 = 27$
- $4 \times 8 = 32$
- $2 \times 8 = 16$
- $8 \times 7 = 56$
- $1 \times 8 = 8$
- $4 \times 7 = 28$
- $6 \times 8 = 48$
- $8 \times 0 = 0$
- $8 \times 3 = 24$
- $8 \times 1 = 8$
- $8 \times 8 = 64$
- $8 \times 4 = 32$
- $5 \times 7 = 35$
- $7 \times 8 = 56$
- $9 \times 8 = 72$

**Apply** Solve each problem.

- At the stand, carrots are sold in bunches of 8. How many carrots are in 4 bunches?  
**32 carrots**
- Mrs. Martinez bought 6 pounds of tomatoes and 4 pounds of onions. How many pounds of vegetables did she buy? **10 pounds**
- Jeffrey spent \$3.85 at the vegetable stand. How much change did he receive from \$5.00?  
**\$1.15**
- Find the facts.** How many small squares are there in each row of a checkerboard? How many rows of squares are there? How many small squares are on a checkerboard?

**There are 8 rows of 8 small squares for a total of 64 squares.**

Using Problem-Solving Strategies, page 418  
More Practice Set 51, page 369 **137**

## Enrichment 51

Name \_\_\_\_\_ E51

**Square Numbers**

A **square number** is the product of a number multiplied by itself.

1. Use the grid to draw the first 8 square numbers. The first 3 are done for you.

2. List the first 8 square numbers. **1, 4, 9, 16, 25, 36, 49, 64**

3. In the table, write the square size and square number for the squares you drew in exercise 1. Then find the differences.

Square size	1 x 1	2 x 2	3 x 3	4 x 4	5 x 5	6 x 6	7 x 7	8 x 8
Square number	1	4	9	16	25	36	49	64
Difference		3	5	7	9	11	13	15

4. What pattern did you find in the table? **The differences are odd numbers beginning with 3 and ending with 15.**

Use the pattern to find the next 6 square numbers.

5. <b>81</b>	6. <b>100</b>	7. <b>121</b>
8. <b>144</b>	9. <b>169</b>	10. <b>196</b>

11. Use a calculator to check your answers to Exercises 5-10. (The ninth square number is  $9 \times 9$ ).

## Additional Resource 51

Name \_\_\_\_\_ Additional Resource 51

**Maintenance**

Add or subtract.

1. $\begin{array}{r} 43 \\ + 15 \\ \hline 58 \end{array}$	2. $\begin{array}{r} 53 \\ + 19 \\ \hline 72 \end{array}$	3. $\begin{array}{r} 159 \\ + 28 \\ \hline 187 \end{array}$	4. $\begin{array}{r} 86 \\ - 25 \\ \hline 61 \end{array}$
5. $\begin{array}{r} 73 \\ - 27 \\ \hline 46 \end{array}$	6. $\begin{array}{r} 245 \\ - 39 \\ \hline 206 \end{array}$	7. $\begin{array}{r} 6548 \\ - 735 \\ \hline 7283 \end{array}$	8. $\begin{array}{r} 4273 \\ - 454 \\ \hline 3819 \end{array}$
9. $\begin{array}{r} 6254 \\ - 3465 \\ \hline 2789 \end{array}$	10. $\begin{array}{r} 537 \\ + 42 \\ \hline 579 \end{array}$	11. $\begin{array}{r} 35 \\ + 487 \\ \hline 522 \end{array}$	12. $\begin{array}{r} 1534 \\ + 29 \\ \hline 1563 \end{array}$
			13. $\begin{array}{r} 8254 \\ + 176 \\ \hline 8430 \end{array}$
			14. $\begin{array}{r} 1249 \\ + 19 \\ \hline 1268 \end{array}$

Use the table to help you solve each problem.

13. How many pounds of fruit were sold?  
**13,185 pounds**

14. How many more pounds of apples were sold than pounds of cherries?  
**4,138 more pounds**

Fruit Sales for One Week	
Fruit	Number of pounds
Apples	4,327
Peaches	2,169
Pears	300
Bananas	6,200
Cherries	189



## Objective 52 (Target Objective)

Write products for multiplication facts using 0 through 9 as factors.

### Lesson Theme

Art: Crafts

### Materials

- Counters (Punchouts or Math Kit)
- Small objects

## Introduction

**Using Concrete Materials** Have pairs of students work together. Ask one student in the pair to write a basic fact of nine [ $3 \times 9$ ] and the other display this fact [3 groups of 9] using counters or other small objects. Together have the pair decide on the product of this fact. Have each pair repeat this exercise for several facts of 9 alternating the tasks of writing and displaying.

Explain that there is only one more multiplication fact for the students to learn. Ask if any student knows which fact it is. [ $9 \times 9$ ]

## Using the Pages

**Teach** Read the example and have students count how many groups of spools there are. [9] Then have them count the number of spools in each group. [9]

**Try** Point out a pattern in the products for facts having a factor of 9: 9, 18, 27, 36, 45, 54, 63, 72, and 81. Explain that the sum of the digits in each product is always 9.

**Practice** These exercises focus primarily on multiplication facts using 9 as a factor, but there are also exercises with factors other than 9.

**Apply Problem Solving** Have students restate the problems in their own words. For Problem 36, students should realize that they need information from Problems 33 and 35.

**Write a problem** Ask students to write a problem using addition and multiplication with the following information.

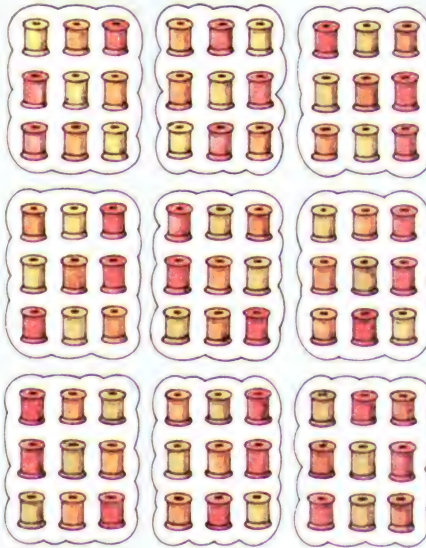
- One spool pig needs 7 spools.
- One spool cat needs 5 spools.
- One spool dog needs 6 spools.

## 9 in Multiplication

Rosita and Manuel decided to make spool figures for gifts. They made 9 clowns. For each clown they used 9 spools. How many spools did they use for the clowns?

Find  $9 \times 9$ .

Think of 9 groups of 9.



$$9 \times 9 = 81$$

They used 81 spools for the clowns.

**Try** Multiply.

$$\begin{array}{r} \text{a. } 9 \\ \times 3 \\ \hline 27 \end{array}$$

$$\begin{array}{r} \text{b. } 5 \\ \times 9 \\ \hline 45 \end{array}$$

$$\begin{array}{r} \text{c. } 9 \\ \times 7 \\ \hline 63 \end{array}$$

$$\begin{array}{r} \text{d. } 8 \times 9 \\ 72 \\ \hline 138 \end{array}$$

$$\begin{array}{r} \text{e. } 9 \times 0 \\ 0 \end{array}$$

$$\begin{array}{r} \text{f. } 6 \times 9 \\ 54 \end{array}$$



## Practice 52

**Sample** P52

Multiply

1. $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$	2. $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$	3. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$	4. $\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$	5. $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$
6. $\begin{array}{r} 0 \\ \times 9 \\ \hline 0 \end{array}$	7. $\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$	8. $\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$	9. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$	10. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$

Solve the problem.

11. Carlos has 9 pages of stamps. Each page has 8 stamps. How many stamps does Carlos have in all on the 9 pages?  
72 stamps

12. Students from two classes sit in 5 rows in the auditorium. There are 9 students in each row. How many students are there in all?  
45 students

Multiply to complete the diagram

## Reteaching 52

**Sample** R52

This picture shows two multiplication facts

3 groups of 9  $3 \times 9 = 27$  9 groups of 9  $9 \times 9 = 81$

Complete the multiplication table. Use the sample below to help you.

$\times$	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81



## Practice Multiply.

1.  $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$
2.  $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$
3.  $\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$
4.  $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$
5.  $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$
6.  $\begin{array}{r} 9 \\ \times 0 \\ \hline 0 \end{array}$
7.  $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$
8.  $\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$
9.  $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$
10.  $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$
11.  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$
12.  $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
13.  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$
14.  $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$
15.  $9 \times 2 = 18$
16.  $5 \times 6 = 30$
17.  $9 \times 8 = 72$
18.  $4 \times 9 = 36$
19.  $0 \times 9 = 0$
20.  $8 \times 8 = 64$
21.  $9 \times 3 = 27$
22.  $5 \times 9 = 45$
23.  $7 \times 8 = 56$
24.  $6 \times 9 = 54$
25.  $8 \times 9 = 72$
26.  $7 \times 4 = 28$
27.  $7 \times 9 = 63$
28.  $3 \times 8 = 24$
29.  $9 \times 4 = 36$
30.  $6 \times 8 = 48$
31.  $9 \times 6 = 54$
32.  $9 \times 9 = 81$

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.  
Discuss your thinking with another student.

33. Rosita made 9 spool pigs. For each pig, she used 7 spools. How many spools did Rosita use to make the spool pigs?  
**63 spools; M**
34. Manuel used 45 spools making horses. Rosita made 5 horses using 8 spools for each horse. Who used more spools making horses?  
**Manuel; M, P**
35. Manuel had 20 spools. He needed 13 spools for a giraffe and 8 spools for a horse. Did he have enough spools?  
**No; M**
36. There are 20 spools in each box. Rosita wants to make 1 giraffe, 3 horses, and 2 pigs. She thinks she needs 6 boxes. Is this reasonable? Why or why not?  
**No; she needs 51 spools or 3 boxes of spools; P, C**

## CALCULATOR

Use your calculator to find each product. Then add the digits in the product. What do you notice?

**The sum of the digits is 9, 18, or 27.**

$$9 \times 382 = 3,438 \quad 3 + 4 + 3 + 8 = 18$$

1.  $9 \times 52 = 468$  18
2.  $9 \times 68 = 612$  9
3.  $9 \times 37 = 333$  9
4.  $9 \times 84 = 756$  18
5.  $9 \times 99 = 891$  18
6.  $9 \times 16 = 144$  9
7.  $9 \times 578 = 5,202$  9
8.  $9 \times 627 = 5,643$  18
9.  $9 \times 112 = 1,008$  9
10.  $9 \times 813 = 7,317$  18
11.  $9 \times 633 = 5,697$  27
12.  $9 \times 987 = 8,883$  27
13.  $9 \times 135 = 1,215$  9
14.  $9 \times 333 = 2,997$  27
15.  $9 \times 789 = 7,101$  9

More Practice Set 52, page 370 **139**

## Assignment Guide

basic 1–35  
average 1–35  
enriched 1–36

**More Practice Set 52,**  
page 370

## Follow-Up

**Reteaching** Have students complete their multiplication fact files.

## Enrichment Using Concrete Materials

You may wish to show students how to multiply by 9s with their fingers. They should think of each finger as numbered in the picture. For  $4 \times 9$ , they bend down the finger numbered 4. The fingers to the left of the bent finger show the tens in the product (3). The fingers to the right show the ones (6). Have students demonstrate each fact of 9 using this method.



## Computer Assisted Instruction

Mathematics Courseware Series  
• Multiplication 1, Activities 4, 5, 7, 8  
Mathematics Action Games  
• Picture Parts, Hardest Level

## Enrichment 52

Name \_\_\_\_\_ E52

**T-Shirts**

The T-shirt Factory sells custom T-shirts by either plan A or B.

Number of T-shirts	Cost Under Plan A (\$)	Cost Under Plan B (\$)
1	7	21
2	14	26
3	21	31
4	28	36
5	35	41
6	42	46
7	49	51
8	56	56
9	63	61
10	70	66
11	77	71
12	84	76

Complete the table on the right. Then answer the following questions.

19. Debby wants to buy 5 T-shirts. Under which plan would the 5 shirts cost less?  
**Plan A**
20. Bob wants to buy 12 shirts. Which plan should Bob use?  
**Plan B**
21. How many shirts would cost the same amount under both plans?  
**8 shirts**
22. Ellen wants to buy 10 T-shirts. Which plan should she choose?  
**Plan B**
23. Jon is going to use plan A to buy 6 T-shirts. How much will he save by using plan A instead of plan B?  
**\$4.00**
24. What is the greatest number of shirts you could buy for \$40 under either plan A or plan B?  
**5 shirts under Plan A**

## Additional Resource 52

Multiplication Table

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

**Math Poster P Multiplication: Table of Facts** Use this poster for reference to help students review the basic facts. See *Answer Key* for teaching suggestions.

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

1.  $40 + 30 + 27$  [97]
2.  $605 - 204$  [401]
3.  $7 \times 8$  [56]
4.  $6 \times 40$  [240]
5.  $592 - 38$  [554]
6.  $761 + 407$  [1,168]



## Practice

Mixed Practice for Objectives 45–52

### Materials

- Spinners (Math Kit)
- Flashcards

## Introduction

**Warm-Up Review** Divide the class into two teams for a *Multiplication Bee*. The first person on Team 1 is shown a multiplication flashcard using the facts involving factors of 0–9. The student has 3 seconds to give the correct product. If the correct product is given in the allotted time, the team gets 1 point. Do not eliminate any student for answering incorrectly or too slowly. The team merely does not get a point for that turn. Alternate turns between teams. The team with the highest score at the end of the playing period is the winner.

## Using the Pages

**Practice** Explain the game on page 140 and how the chart is set up. Exercises 1–25 involve finding the products for the facts given. To solve Exercises 26–30, students must add the products for each round to find each person's score. The answer to Exercise 31 is dependent on the answers to Exercises 1–30.

**Error Analysis** Watch for students who are still struggling with the basic multiplication facts. Suggest these students practice counting by 3s, 4s, 5s, and so on. Then have pairs of students use flashcards to quiz each other.

**Apply Problem Solving** Encourage students to solve each problem mentally and then to check their answers.

**Choose the Operation** Problems 53 and 55 involve multiplication. Problem 54 involves subtraction and Problem 56 involves addition. Problem 57 is a multiple-step problem.

**List all possibilities** For Problem 58, there is more than one possible answer. Write 36 on the board. Beneath it have students write the factors that will give a product of 36. Have students do the same with 24.

### Answers, page 140

- |        |        |        |        |
|--------|--------|--------|--------|
| 1. 12  | 2. 18  | 3. 32  | 4. 2   |
| 5. 24  | 6. 24  | 7. 7   | 8. 16  |
| 9. 0   | 10. 21 | 11. 36 | 12. 0  |
| 13. 42 | 14. 40 | 15. 6  | 16. 15 |
| 17. 54 | 18. 8  | 19. 12 | 20. 25 |
| 21. 27 | 22. 10 | 23. 0  | 24. 56 |
| 25. 4  |        |        |        |

## Practice: Multiplication Facts

The Brooks family played a multiplication game using two spinners.



On each turn, the player spun both spinners and multiplied the numbers. The product was the player's score for that round.

Find each player's score for each round. **See margin.**

Player	First round	Second round	Third round	Fourth round	Fifth round
Mr. Brooks	1. $3 \times 4$	2. $6 \times 3$	3. $8 \times 4$	4. $1 \times 2$	5. $4 \times 6$
Mrs. Brooks	6. $6 \times 4$	7. $1 \times 7$	8. $2 \times 8$	9. $6 \times 0$	10. $3 \times 7$
Chad	11. $4 \times 9$	12. $5 \times 0$	13. $7 \times 6$	14. $5 \times 8$	15. $3 \times 2$
Julie	16. $5 \times 3$	17. $9 \times 6$	18. $8 \times 1$	19. $2 \times 6$	20. $5 \times 5$
Todd	21. $9 \times 3$	22. $2 \times 5$	23. $9 \times 0$	24. $7 \times 8$	25. $1 \times 4$

Find the total points for each player.

26. Mr. Brooks  
**88**

27. Mrs. Brooks  
**68**

28. Chad  
**124**

29. Julie  
**114**

30. Todd  
**97**

\*31. Who had the highest score?  
**Chad**

140

## Practice Game

### Square Scores

**Number of players:** 2–3

**Materials:** Worksheet with grid of dots and multiplication facts as shown in the illustration

### Rules

1. Players take turns drawing a line connecting any two adjacent dots.
2. When a player's line encloses a square, he or she gives the answer to the fact enclosed. If the answer is correct, the player writes his or her initials in the square.

3. If the answer is incorrect, another player can give the correct answer and initial the square.

4. A player who closes two boxes with one line can answer both facts and initial both boxes.

5. The player who answers a fact correctly gets another turn.

6. Play continues until all squares are completed.

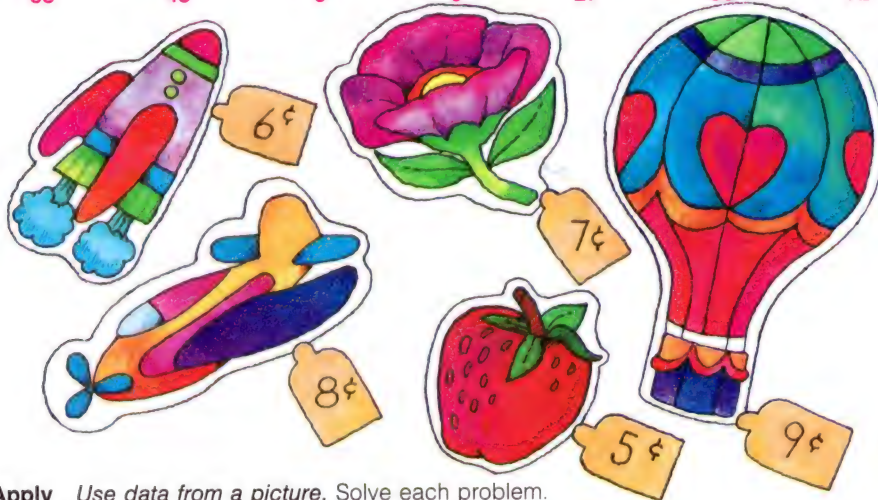
**Scoring:** A player gets 1 point for each square with his or her initials.

**The Winner:** The player with the most points wins.



Multiply.

32. $\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$	33. $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$	34. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	35. $\begin{array}{r} 0 \\ \times 7 \\ \hline 0 \end{array}$	36. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	37. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$	38. $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$
39. $\begin{array}{r} 0 \\ \times 4 \\ \hline 0 \end{array}$	40. $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$	41. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$	42. $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$	43. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$	44. $\begin{array}{r} 0 \\ \times 1 \\ \hline 0 \end{array}$	45. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
46. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$	47. $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$	48. $\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$	49. $\begin{array}{r} 0 \\ \times 0 \\ \hline 0 \end{array}$	50. $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$	51. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	52. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$



**Apply** Use data from a picture. Solve each problem.

53. How much do 6 strawberry stickers cost?  
**30¢**
54. How much more is an airplane sticker than a rocket sticker?  
**2¢ more**
55. Sherry bought 8 balloon stickers. How much did she spend?  
**72¢**
56. Paul bought a rocket sticker, a balloon sticker, and a strawberry sticker. How much did he spend?  
**20¢**
57. Katie bought 2 flower stickers, 3 strawberry stickers, and 2 airplane stickers. How much change did she receive from 50¢?  
**5¢**
58. **Thinking skills** If the product of two numbers is 36, what could the two numbers be?  
 **$4 \times 9$ ,  $6 \times 6$ ,  $1 \times 36$ ,  $2 \times 18$ ,  $3 \times 12$**

Using Problem-Solving Strategies, page 419 **141**

## Assignment Guide

basic	1–15, 26–28, 32–54 odd or even
average	1–30, 32–56 odd or even, 58
enriched	1–31, 32–56 odd or even, 57–58

**Homework to do with others** Tell each student to describe his or her hobby or interest to another person. With the help of the other person, have each student make up a problem about the hobby or interest, discuss possible problem-solving strategies to use, and find a solution to the problem. Ask each student to bring a copy of his or her problem to class.

## Follow-Up

**Mental Math** Have students play the game that is described below the lesson pages. This game may be played with other multiplication facts or addition, subtraction, or division facts. The grid may be enlarged to accommodate more facts.

For an additional activity, you may wish to have the students make spinners and play the game described on page 140.

## Reading and Writing Mathematics

Read the following equations to students and have them tell whether each equation is *true* or *false*. If it is false, have them also give the correct answer.  $9 \times 7 = 64$  [False;  $9 \times 7 = 63$ ]  $3 \times 4 = 12$  [True]  $8 \times 7 = 65$  [False;  $8 \times 7 = 56$ ]  $6 \times 5 = 30$  [True]

## Computer Assisted Instruction

Mathematics Courseware Series

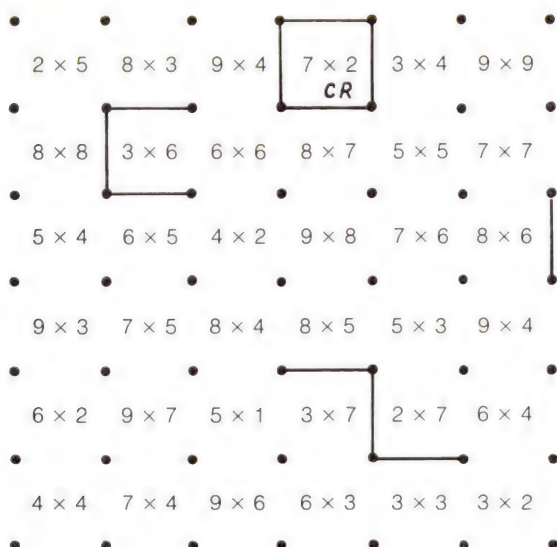
- Multiplication 1, Activity 6
- Mathematics Action Games
- Pyramid Puzzler, Standard Level

## Daily Maintenance

**Estimation** Would you use milliliters or liters to measure the amount of liquid each container holds?

1. Perfume bottle [Milliliters]
2. Paint can [Liters]
3. Carton of cream [Milliliters]
4. Washing machine [Liters]
5. Rocket's fuel tank [Liters]

Using Problem-Solving Strategies, page 419





## Objective 53

Write problems involving addition, subtraction, and multiplication.

### Lesson Theme

Consumer Topics: Buying Toys

### Materials

- Classroom objects (books, pencils, rulers)
- Catalogs

## Introduction

**Using Concrete Materials** Give students practice in making up story problems by using small classroom objects. For example, have one child place several objects on his desk. Discuss with students how to write a story problem about the objects. [John placed 1 pencil, 2 books, and 1 ruler on his desk. How many objects were there in all?] Divide the class into small groups and have each group use several small objects to write and display a new story problem.

## Using the Pages

**Teach** Discuss the problem that Lin wrote. Point out that Lin told enough so that the problem could be solved by asking questions such as, "Did Lin tell what was bought and how much each cost?" [Yes] "Did Lin ask a question?" [Yes]

**Try** Students may write different problems for the exercises. Discuss the various problems that may be written about the conditions presented in Exercise a. For example, one could ask for the total price of the two items or how much more one costs than the other. Some exercises like Exercise b give conditions that will require a multiple-step problem to be written.

**Apply Problem Solving** Remind students that each problem must always ask a question. Accept any reasonable story problem. You may want students to trade papers and solve the problems.

**Using data from outside the text** Give a catalog to each of several small groups of students. Have each group find an item in the catalog that comes packaged in groups of more than one such as 1 package of 3 pairs of socks. Have students use this information to write a problem. [If there are 3 pairs of socks in each package, how many pairs are there in 3 packages?]

### Problem Solving

### Write a Problem



Lin saw the items pictured above advertised in the newspaper. He wrote this problem about buying two of the same item.

*Mark bought a train model and an airplane model. The model kits sold for \$7 each. What was the total cost of the 2 models?*

**Try** Write a problem about

- buying a puzzle and a game.
- the change received from \$20 when buying two of the same item.

Answers will vary. See margin for sample problems.

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## Practice 53

Name \_\_\_\_\_ P53

Write a problem about: *Answers will vary. Sample problem given.*

- buying four of the same item.  
How much will John have to pay for four jigsaw puzzles?
- buying three different items.  
Rachel bought a bat, a calculator and a bear. What was the total cost?
- the sale price of an item on sale for \$2 off regular price.  
What is the price for a calculator on sale for \$2 off the regular price?
- buying two of one item and one of another item.  
Colleen bought two stuffed animals and a calculator. How much money did she spend?
- the change received from \$10 when you buy one item.  
Scott gave the clerk \$10 for a bat. How much change did he get?
- how much less one item costs than another.  
How much less does the puzzle cost than the calculator?

## Reteaching 53

Name \_\_\_\_\_ R53

Write a problem about buying paper and pencils:  
*Ray bought paper for \$3 and a box of pencils for \$1. What was the total cost?*

Write a problem about: *Answers will vary. Sample answers are given.*

- buying 2 boxes of pencils.  
John bought 2 boxes of pencils for \$1 each. What was the total cost?
- buying paint, paper, and pencils.  
Helen bought paint, paper, and pencils. Which item cost the most?
- how much more paint costs than pencils.  
How much more does it cost to buy a box of paint than to buy a box of pencils?
- the change received from \$5 when buying paper.  
Jena gave the cashier \$5 for a tablet of paper. How much change did she receive?



# TIME

**STUFFED ANIMALS \$5**

**DOLLS \$8**

**RECORDS \$6**

## Assignment Guide

basic 1-6  
average 1-7  
enriched 1-8

**More Practice Set 53, page 370**

## Follow-Up

**Extra Practice Write a Problem** Write several types of items with quantities on the board (3 boys, 2 girls, 8 pencils, 5 books, and so on). Have students write a story that will include some of these items. Look for well-written work. Discuss the various types of mathematical problems that can be made with the information in the stories.

**Reteaching Write a Problem** Have students finish each story problem by writing the question.

- Kim has 9 guppies and 3 goldfish. [How many fish does Kim have in all? or, How many more guppies than goldfish does Kim have?]
- Kevin is 5 years old. Barbara is 13 years old. [How much older than Kevin is Barbara?]
- Dale has 6 trucks. Each truck has 8 wheels. [How many wheels are there in all?]

## Cooperative Learning Groups

See page 478 of this Teacher's Edition.

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- |                      |                      |
|----------------------|----------------------|
| 1. $2 \times 6$ [12] | 2. $3 \times 6$ [18] |
| 3. $8 \times 3$ [24] | 4. $4 \times 3$ [12] |
| 5. $3 \times 2$ [6]  | 6. $9 \times 2$ [18] |

**Apply** Write a problem about

- buying a book and a doll.
- the change received from \$10 when paying for a record.
- which of two items costs more.
- buying two different items.
- how much more one item costs than another.
- the sale price of an item when it is on sale for \$1 off the regular price.
- the change received from \$20 when buying two different items.
- deciding if you have enough money to buy two of a certain item.

**Answers will vary. See margin for sample problems.**


More Practice Set 53, page 370 **143**

## Enrichment 53


Name: \_\_\_\_\_ E53

**At the School Store**

Solve each problem.

 Pencils  
7c each or  
5 for 25c

- What would it cost to buy 6 pencils in the least expensive way?  
5 for 25c and 1 for 7c = 32c
- Which would be less expensive, 4 pencils or 5 pencils?  
5 pencils
- How could you buy 8 pencils in the least expensive way?  
5 for 25c and 3 at 7c each = 46c
- What is the least expensive way to buy 9 pencils?  
10 for 50c
- What is the cost of 8 pencils in the least expensive way?  
46c
- What is the cost of 6 raisin snacks?  
54c
- What is the cost of 5 nut snacks and 4 raisin snacks?  
76c
- If you bought 7 raisin snacks and paid for them with a dollar, how much change should you get back?  
37c change
- If you had 50c, how much more money would you need to buy 3 raisin snacks and 6 nut snacks?  
25c more

 SNACKS  
Nuts 8c Raisins 9c


## Additional Resource 53


Name: \_\_\_\_\_ Additional Resource 53

**Project Writing Problems**

Materials needed: pencil, paper, scissors, paste, newspapers or magazines.

- Find advertisements in a newspaper or magazine. They might look like these:


 4 CANS FOR \$1.00

 Round trip to Funland \$259.00

- Cut out four advertisements.
- Write a problem for each advertisement. Paste the advertisement next to the problem.
- Find each answer.

Here is an example of one such problem.

Mr. and Mrs. Thomas are planning a trip to Funland. When they arrive, they are going to rent a car. The cost of each round trip ticket is shown in the advertisement. The cost of the car will be \$48. How much will the trip and the car cost them?

 Round trip to Funland \$259.00

$$\begin{array}{r} 259 \\ 259 \\ + 48 \\ \hline 566 \end{array}$$

The trip and the car will cost them \$566.

**Answers, pages 142-143**

- Pam bought a puzzle for \$6 and a game for \$9. What was the total cost for the puzzle and the game?
- Peter bought 2 books that sold for \$3 each. He paid \$20. How much change did he receive?

- Bonnie bought a book for \$3 and a doll for \$8. What was the total cost of these items?
- Glen bought a record for \$6. He paid \$10. How much change did he receive?
- Stuffed animals sell for \$5 each. Model kits sell for \$7 each. Which costs more, a stuffed animal or a model kit?

**Answers are continued on page 145 of this Teacher's Edition.**



## Chapter 5 Test

An acceptable score for each objective is suggested on the Chapter 5 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

Objective	Test items	Text pages
45	1, 2	122-123
46	3-8	124-125
47	9-14	126-127
48	15-17	128-129
49	18-23	132-133
50	24-26	134-135
51	27-29	136-137
52	30-32	138-139
53	33, 34	142-143

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
34	100	25	74
33	97	24	71
32	94	23	68
31	91	22	65
30	88	21	62
29	85	20	59
28	82	19	56
27	79	18	53
26	76	17	50

### Additional Ideas for Evaluation

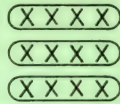
See pages 464-467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 5 Form for Individualizing
- Cumulative Record Folder

## Chapter 5 Test

Copy and complete each sentence for the picture below.



1.  $4 + 4 + 4 =$  12

2.  $3 \times 4 =$  12

Multiply.

3.  $\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$

4.  $\begin{array}{r} 3 \\ \times 3 \\ \hline \end{array}$

5.  $\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$

6.  $\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$

7.  $\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$

8.  $\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$

9.  $\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$

10.  $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$

11.  $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$

12.  $\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$

13.  $\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$

14.  $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$

15.  $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$

16.  $\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$

17.  $\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$

18.  $\begin{array}{r} 0 \\ \times 1 \\ \hline \end{array}$

19.  $\begin{array}{r} 2 \\ \times 1 \\ \hline \end{array}$

20.  $\begin{array}{r} 1 \\ \times 6 \\ \hline \end{array}$

21.  $\begin{array}{r} 4 \\ \times 0 \\ \hline \end{array}$

22.  $\begin{array}{r} 6 \\ \times 0 \\ \hline \end{array}$

23.  $\begin{array}{r} 5 \\ \times 1 \\ \hline \end{array}$

24.  $\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$

25.  $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$

26.  $\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$

27.  $\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$

28.  $\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$

29.  $\begin{array}{r} 8 \\ \times 8 \\ \hline \end{array}$

30.  $\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$

31.  $\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$

32.  $\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$



Answers will vary. See below.

Use the information above to write a problem about

33. buying two tote bags.

34. the change received when buying an item.

33. Maggie bought 2 tote bags at \$6 each. What was the total cost of the tote bags?

34. John bought a knapsack for \$9. How much change did he receive from a \$20 bill?

## Chapter 5 Letter Home

**Keeping You Posted**

In mathematics, we have been studying multiplication facts through 9. You may want to use multiplication flashcards to help you learn these facts. We will study multiplication exercises such as 34, 50 and 29 in 5th grade.

To: Family

What has eyes but cannot see?

To solve the riddle, work each exercise. Each time an answer matches a number in the code, write the letter for that exercise in the code. Not all letters are used.

1. $3 \times 4 =$ <u>12</u> A	2. $5 \times 5 =$ <u>25</u> F	3. $9 \times 9 =$ <u>81</u> R
4. $7 \times 8 =$ <u>56</u> I	5. $6 \times 5 =$ <u>30</u> O	6. $8 \times 3 =$ <u>24</u> B
7. $8 \times 8 =$ <u>64</u> A	8. $2 \times 7 =$ <u>14</u> D	9. $0 \times 7 =$ <u>0</u> O
10. $5 \times 3 =$ <u>15</u> T	11. $3 \times 9 =$ <u>27</u> N	12. $6 \times 8 =$ <u>48</u> U
13. $8 \times 4 =$ <u>32</u> W	14. $7 \times 1 =$ <u>7</u> V	15. $7 \times 6 =$ <u>42</u> O
16. $9 \times 8 =$ <u>72</u> Y	17. $9 \times 5 =$ <u>45</u> T	18. $4 \times 7 =$ <u>28</u> P

A P O T T O  
64 28 42 15 12 45 30

## Chapter 5 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Posttest Chapter 5

Complete each sentence for the picture below.

1.  $4 \times 4 \times 4 \times 4 =$  256

2.  $4 \times 4 =$  16

Multiply.

3. $\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$	4. $\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$	5. $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$
6. $\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$	7. $\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$	8. $\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$
9. $\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$	10. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$	11. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$
12. $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$	13. $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	14. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$
15. $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$	16. $\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$	17. $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$

Posttest Chapter 5

Multiply

18. $\begin{array}{r} 0 \\ \times 3 \\ \hline \end{array}$	19. $\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$	20. $\begin{array}{r} 1 \\ \times 5 \\ \hline \end{array}$
21. $\begin{array}{r} 9 \\ \times 0 \\ \hline \end{array}$	22. $\begin{array}{r} 8 \\ \times 0 \\ \hline \end{array}$	23. $\begin{array}{r} 7 \\ \times 1 \\ \hline \end{array}$
24. $\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$	25. $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$	26. $\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$
27. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$	28. $\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$	29. $\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$
30. $\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$	31. $\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$	32. $\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$

Puppy \$25 Kitten \$11

Use the information above to write a problem about

33. buying two kittens

34. the change received when buying an item



# CHALLENGE

Multiples



$$1 \times 5 = 5$$



$$2 \times 5 = 10$$



$$3 \times 5 = 15$$



$$4 \times 5 = 20$$



$$5 \times 5 = 25$$



Laurel counted her pennies by putting them in stacks of 5.

5, 10, 15, 20, 25 are *multiples* of 5.

The next four multiples of 5 are 30, 35, 40, 45.

Complete each table.

Multiples of 6

$\times$	1	2	3	4	5	6	7	8	9
6	1.	2.	3.	4.	5.	6.	7.	8.	9.

6 12 18 24 30 36 42 48 54

Multiples of 8

$\times$	1	2	3	4	5	6	7	8	9
8	10.	11.	12.	13.	14.	15.	16.	17.	18.

8 16 24 32 40 48 56 64 72

Tell if each number is a multiple of 3. Write yes or no.

19. 18  
Yes

20. 7  
No

21. 27  
Yes

22. 16  
No

23. 25  
No

24. 12  
Yes  
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## Challenge

**Find a pattern** This page introduces multiples. A multiple of a number is the product of that number and another positive integer. At this point, students do not need to formalize the definition, but just need to be able to identify what is and is not a multiple of a given number. To help them decide in Exercises 19–24 what is or is not a multiple, they may need to list the multiples of 3 until they reach 27.

After students have completed page 145, give them tables like the ones below. Ask them to complete the tables and then write a rule for finding the second number in each horizontal pair when they know the first.

1	4
2	8
3	12
4	16
5	20
6	24
7	[28]
8	[32]
9	[36]

[Rule:  
Multiply by 4]

1	7
2	14
3	21
4	28
5	[35]
6	[42]
7	[49]
8	[56]
9	[63]

[Rule:  
Multiply by 7]

Answers, page 143

- Dick bought a model kit for \$7 and a game for \$9. What was the total cost of these items?
- Maria bought a game for \$9 and a puzzle for \$6. How much more did the game cost than the puzzle?
- The regular price of a doll is \$8. It went on sale for \$1 off the regular price. What was the sale price of the doll?
- Bob bought a book for \$3 and a game for \$9. He paid \$20. How much change did he receive?
- Records sell for \$6 each. Angie has \$10 to spend. Does she have enough money to buy 2 records?



## Using Problem-Solving Strategies

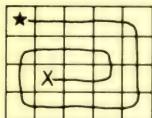
- Draw a picture.
- Work backward.
- Solve a simpler problem.

### Introduction

After students locate the last square on a game board, they find the total number of squares on the board. To find the sixty-eighth square, they count backward from the last square.

### Using the Page

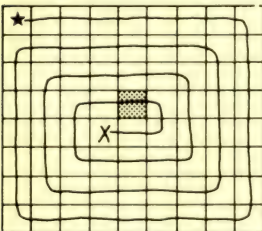
In Problem 1 students are asked to find the last square on the small board. Direct students to copy the small board onto a piece of paper. They can then draw a picture of the path with a pencil, putting an "X" on the last square.



To solve Problem 2, students should use their knowledge of basic multiplication facts. They can multiply the number of rows by the number of columns ( $4 \times 5$ ) to find the total number of squares on the game board. [20]

Knowing that the square marked with an "X" is the twentieth square, the students can now solve Problem 3. By working backward, they can locate the eighteenth square and shade it.

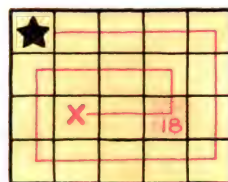
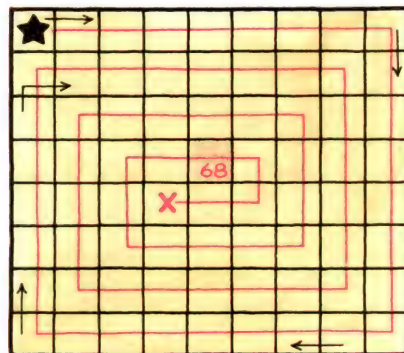
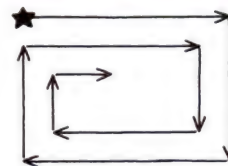
Using the same strategy as in Problems 1–3 (simpler problem), students can solve Problem 4. After drawing the large game board, have them trace with their pencil through the spiral path of squares to find the last square. They should mark the last square with an "X." This last square is the seventy-second square since the board is 8 squares by 9 squares. Counting backward from this square they can locate and shade the sixty-eighth square.



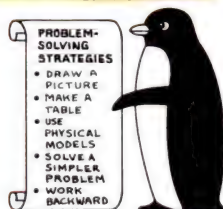
## Using Problem-Solving Strategies

# A DIZZY GAME BOARD

Tina is playing a game on the large board below. She starts in the square with the star and moves through all the squares in the directions shown by the arrows. She may not enter a square more than once. She wants to locate the sixty-eighth square without actually counting all the squares along her path. Can she do it?



1. Copy the small game board on a piece of paper. Then trace a path all the way around to the last square. Mark that square with an "X".
2. How many squares are on the small gameboard? **20**
3. Can you now locate the eighteenth square? **Yes**  
Shade it in.
4. Copy the large game board and follow the same procedure to find the last square on the large board. Mark it with an "X". How many squares are on the board? **72**  
Shade in the sixty-eighth square.



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 402



## Mathematical Background

**Multiplication with Numbers Ending in Zero** Numbers ending with a zero can be renamed as a product of another number and 10. For example, 30 can be renamed as  $3 \times 10$ . Consider the following multiplication problem:

$$4 \times 30$$

If the 30 is renamed, then it becomes:

$$4 \times 3 \times 10$$

Multiplying the first two factors, the product is  $12 \times 10 = 120$ .

Similarly, this principle can be applied to numbers ending with two or three zeros. For example,

$$\begin{aligned} 5 \times 300 &= 5 \times 3 \times 100 \\ &= 15 \times 100 \\ &= 1,500 \end{aligned}$$

A quick procedure for multiplying numbers ending with zeros is to multiply the nonzero parts and to annex the zeros at the end of the product.

**Multiplying Multidigit Numbers** To multiply multidigit numbers, each digit in one factor must be multiplied by each digit in the other factor. For example, to multiply  $6 \times 347$ :

$$\begin{array}{r} 347 \\ \times 6 \\ \hline 42 \quad [6 \times 7] \\ 240 \quad [6 \times 40] \\ 1800 \quad [6 \times 300] \\ \hline 2,082 \end{array}$$

Note that the 6 is multiplied with each digit of the number 347. A more common algorithm is to not write the full products but only place-value information. The algorithm is:

1. Multiply  $6 \times 7$ , record the 2, and write a 4, to indicate 4 tens, above the 4 in 347.
 
$$\begin{array}{r} 4 \\ 347 \\ \times 6 \\ \hline 2 \end{array}$$
2. Multiply  $6 \times 4$  tens, then add the 4 tens, record the 8 tens, and write a 2, indicating 2 hundreds above the 3.
 
$$\begin{array}{r} 24 \\ 347 \\ \times 6 \\ \hline 82 \end{array}$$
3. Multiply  $6 \times 3$  hundreds, then add the 2 hundreds, and record the 20 to indicate 20 hundreds.
 
$$\begin{array}{r} 24 \\ 347 \\ \times 6 \\ \hline 2,082 \end{array}$$

## Contents

Multiplying Tens, Hundreds, and Thousands:	
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Multiplying Multiples of 10: Mental Math	162–163
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## Pretest for Chapter 6

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name _____		Pretest Chapter 6	
Multiply		1. $180$	
1. $6 \times 30$	2. $37 \times 100$	2. $3,700$	
3. $51$	4. $301$	3. $153$	
$\times 3$	$\times 4$	4. $1,204$	
5. $6423$	6. $64$	5. $12,846$	
$\times 2$	$\times 6$	6. $384$	
7. $473$	8. $5412$	7. $946$	
$\times 2$	$\times 3$	8. $16,236$	
9. $146$	10. $235$	9. $730$	
$\times 5$	$\times 7$	10. $1,645$	
11. $1,342$	12. $207$	11. $4,026$	
$\times 3$	$\times 8$	12. $1,656$	
13. $3,007$	14. $7,059$	13. $27,063$	
$\times 9$	$\times 4$	14. $28,236$	
Solve each problem. Use these products for the factor 15.			
15 30 45 60 75 90 105			
15. What pattern is made by the ones digits?	15. $5, 0, \text{ etc.}$		
16. What pattern is made by the sums of the digits? If there is a 2-digit sum, add again to get a 1-digit sum.	16. $6, 3, 9, \text{ etc.}$		

Name _____		Pretest Chapter 6	
Estimate each product.		continued	
17. $4 \times 32$	18. $48 \times 65$	17. $120$	
		18. $3,500$	
Multiply		19. $500$	
19. $10 \times 50$	20. $50 \times 40$	20. $2,000$	
21. $70 \times 500$	22. $6 \times 600$	21. $35,000$	
		22. $3,600$	
23. $79$	24. $88$	23. $2,370$	
$\times 30$	$\times 15$	24. $1,320$	
25. $613$	26. $608$	25. $41,071$	
$\times 67$	$\times 48$	26. $29,184$	
27. $\$0.65$	28. $\$1.23$	27. $\$30.55$	
$\times 47$	$\times 5$	28. $\$6.15$	
Tell whether you add, subtract, or multiply. Then find the answer.			
29. A large airplane has 347 passenger seats. How many passengers can the plane carry in 3 trips?	29. $1,041$		
	$87 \text{ passengers}$		
30. Another airplane can seat 143 passengers. 56 seats are empty. How many passengers are on the plane?	30. $87 \text{ passengers}$		



# Teaching Chapter 6



## Problem Solving

**Problem-Solving Strategies** Throughout this chapter, students have opportunities to practice the strategies introduced earlier, such as *Find a pattern*, *Use physical models*, and *Draw a picture*. As in Chapter 5, when students use the strategy *Choose the operation*, they will need to distinguish between situations that call for addition, subtraction, or multiplication. Note that key words such as “in all” or “total” *do not* help students distinguish between addition and multiplication.

It is important that students understand that there is more than one way to solve most nonroutine problems. After students find one way to solve a problem, it is a good idea to encourage them to find a second strategy. For example, if students attempt the problem on page 420 on their own, they may be able to use coins (or pieces of paper that represent them) to experiment and find answers to the problem. After students solve the problem in this way, it is a good idea to continue your discussion of the problem. Ask if any student has another way to solve the problem. If no one has done so, encourage students to make a systematic list of their solutions. Once they have been working on their lists awhile, students should discover that the problem can be solved by making a list of all the possibilities.



## Calculators and Computers

**Calculators** Students use a calculator to look for patterns in a multiplication table. After students have completed the activity on page 155 and **Additional Resource 58**, you may want to discuss the patterns they have discovered. On pages 156–157, students use a calculator to show that multiplication is repeated addition when the factors are other than basic facts.

**Using a Calculator in Problem Solving** Students need to compute to solve word problems in this chapter. Whenever you allow students to use a calculator, it permits them to focus on the problem-solving process, without causing them to worry about computational procedures.

**Computers** On page 171, students practice writing programs with REM statements and predicting outputs for programs. You might want to discuss the fact that persons reading a program may need some reminders about the functions of its various parts. Students may enjoy thinking of ways to concisely state identifying information for a given program.



## Estimation and Mental Math

**Estimation** In this chapter, students estimate products by *rounding* and then multiplying. For example,  $42 \times 68$  is approximately 2,800 because  $40 \times 70 = 2,800$ .

If some students encounter difficulty, you might introduce the *front-end* method, in which the lead digit is kept the same. For example:  $612 \times 25$  is approximately 12,000 because  $600 \times 20 = 12,000$ . This method's estimates are less satisfactory but still close enough to enable students to judge the reasonableness of their answers. On pages 168–169, students also estimate by finding a *range*.

In **Math Poster R**, students estimate the number of marbles in a container, by *sampling and predicting*. They use the number of marbles arranged on the container lid as their sample. It is a good idea to allow students to begin working on the exercise before any class discussion. Encourage students to discuss the strategies they used to arrive at their answers.

**Mental Math** In this chapter, the focus is on mentally computing the products of *special numbers*—multiples of 10, 100, and 1,000. For example:

$$8,000 \times 700 = 5,600,000$$

Be aware that some students may become confused if the product before considering the ending zeros also has a zero. For example:

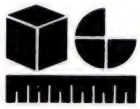
$$400 \times 50 = 20,000$$

In **Additional Resources 54** and **65**, students multiply by powers of 10.



Calculators can help students with problem solving. Their mechanical accuracy can free students to concentrate on the problem-solving process.





## Concrete Materials

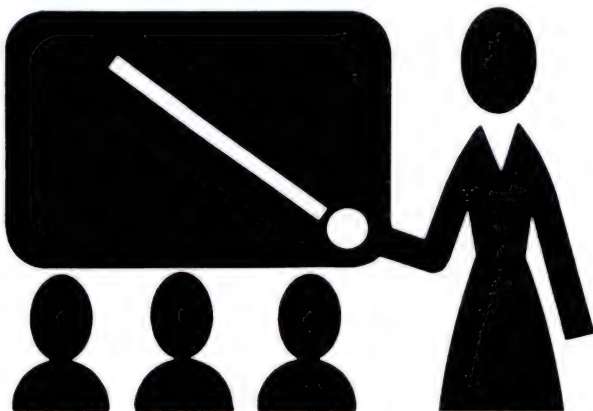
There are three strategies that can help you ensure that students reap the greatest possible benefits from their use of concrete materials.

The first strategy is to make certain that students actually handle the materials. Students gain far more benefit from their own experiences than from observing the experiences of others.

As students handle the concrete materials, it is important that they verbalize what is happening. This is the second strategy for helping students get the most out of their use of concrete materials. Verbalizing not only provides the teacher with feedback on each student's progress toward understanding, but is an invaluable aid to the students themselves in organizing and clarifying their own thoughts and understanding.

The third strategy for using concrete materials to the best advantage, is to direct students to make a record of their actions. It is very important that students make the connection between the physical action and the abstract mathematical representation of that action.

The distributive property of multiplication can be taught, using concrete materials. The activity works well with both one- and two-digit multipliers. Give students problems similar to the following. If each of 13 students has 54 cents, tell how much there is in all. Using dimes and pennies, have groups of students set up 13 stacks of 4 pennies each, and 13 stacks of 5 dimes each. Tell students to count the amounts. Then have them discuss and write their results:  $13 \times 4 = 52$ ,  $13 \times 50 = 650$ ,  $52 + 650 = 702$ . Let them discuss how this activity is similar to the renaming activities taught in the lessons, and how it differs. The distributive property can also be taught using centimeter grid paper, as explained on page 166.



**Ask questions and give responses that promote further student thinking on topics.**



## Teaching Techniques

**Questioning and Responding** Some students will be slower at multiplication computation than others because they have poor recall of multiplication basic facts. When you ask students to do a multiplication computation to check on their understanding, allow enough time for the students with slower recall of basic facts to work through the exercise before you have students give their answers.

**Helping Students Read and Write Mathematics** As students read the lessons, be sure they understand the math vocabulary that is being used: factor, product, ones, tens, hundreds, renaming, digit, and so on. Notice that words like "factor" and "product" have different meanings in everyday usage than they have in mathematics. As students write multiplication computation on their papers or on the chalkboard, give praise for neatness. Writing neatly will help prevent careless errors.

**Teaching Students with Special Needs** When low achievers and special-education students try to do difficult computational procedures, they can become frustrated very easily. Their memory deficiencies and short attention spans cause them to fail. Try to be patient with these students. Check their work one step at a time, so that they can have some success experiences. For learning-disabled students who are easily distracted, have an understanding student work with them to help them stay on task.

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

**Social Studies:** cities (148–149), city fire department (152–153)



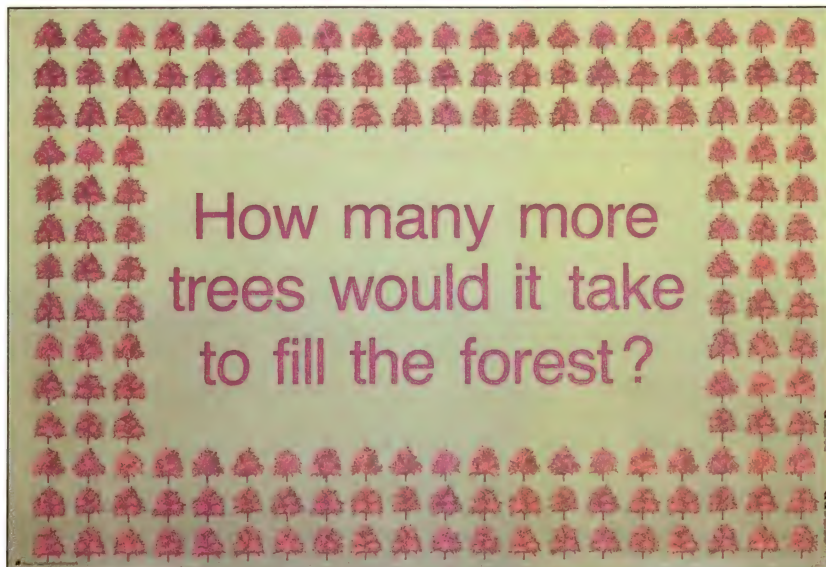
## Thinking Skills

In this chapter, students follow rules and procedures involving multiplication computation, including some mental computation and some estimation strategies. The introductory activities with concrete materials ensure that students **comprehend concepts** needed to understand why those procedures work. In the Thinking Skills exercise on page 169, students **apply concepts** (order and grouping properties). In the Situational Lesson on page 147 and in the *Using Problem-Solving Strategies* features, students **analyze relationships** and also make generalizations by **looking for patterns** (pages 178 and 421).



## Bulletin Board Suggestions

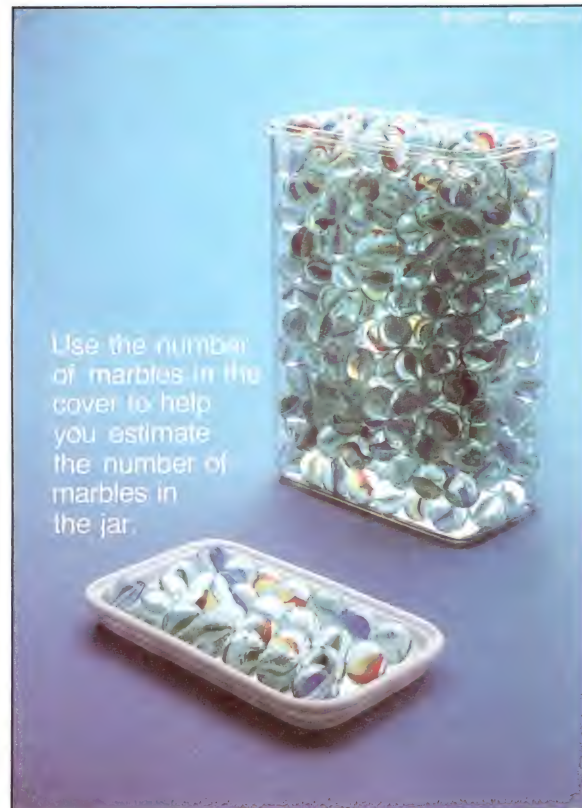
The posters shown here can be used with Chapter 6. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster Q



Math Poster AA



Math Poster R

## Materials Chapter 6

- Basic-facts chart (Teaching Aid B) 148–149, 154–155
- Play money 148–149
- Counting sticks, straws, or pencils 148–149
- Hundreds, tens, units (Punchouts or Math Kit) 150–153, 156–159, 166–167
- Place-value charts (Teaching Aid C) 150–151
- Pattern blocks (Math Kit) 154–155
- Computation squares (Teaching Aid D) 156–157
- Flashcards 160–161
- Worksheets with grids 160–161
- 10 cards (0–9) 160–161
- Calculator 160–161
- Centimeter grid (Teaching Aid K) 162–163, 166–167
- Number lines (Teaching Aid A) 164–165
- Newspapers or catalogs 164–165, 172–173
- Play money (Punchouts) 172–173
- Counters (Punchouts or Math Kit) 174–175
- Centimeter ruler (Teaching Aid G, Punchouts, or Math Kit) 174–175



### Basic Situation

Use the picture on this page to generate a discussion of how eggs and other foods are packaged. Have students work together in groups to select a grocery item. Then have them design a box to be used for packing that item.

### Possible Problems

- How many items will each box contain?
- How large should the box be?
- How heavy will the box be when filled?
- How can the items be packed most efficiently?
- Which of the acceptable boxes will hold the most items?

### Indicators of Success

Students should discover that for some products the number of items which can be packed in a box can be found by multiplying the number of items in each row by the number of rows and then by multiplying this by the number of layers.

As students work with different arrangements of the item, they may discover that the dimensions of the box may be found by multiplying the dimensions of the item by the number of items in each row, column, and stack.

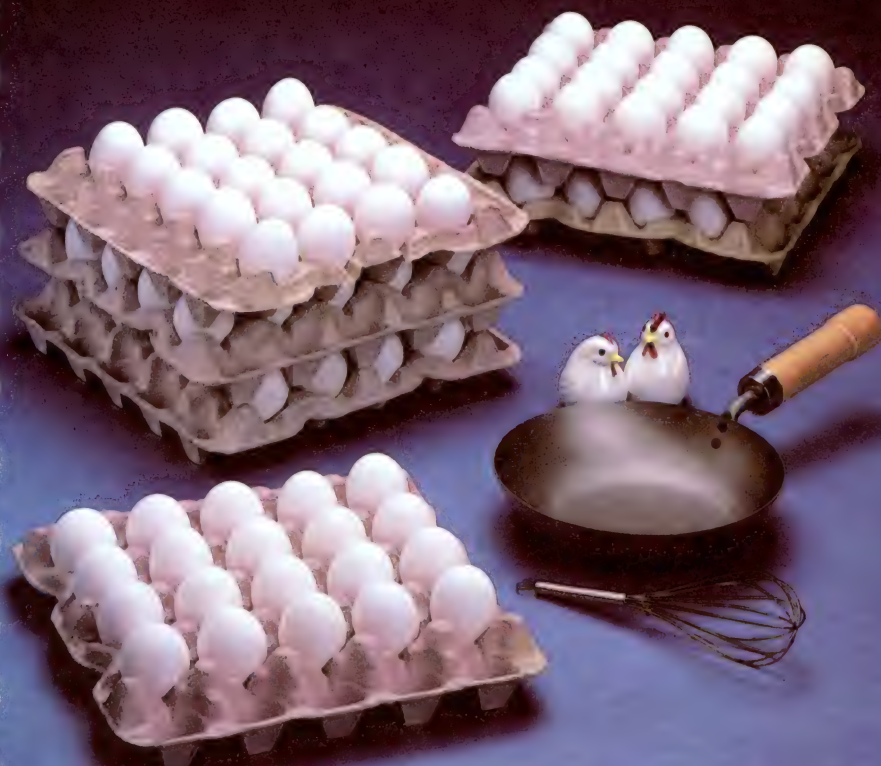
Students might use estimation to decide if a box might be too large or too heavy.

### Ways to Help

Encourage students to choose items such as boxes of tissues, cans of soup, fruit, or vegetables, or other items that they could easily bring from home.

Some students may need help in discovering that some counting problems can be done by multiplying. In the picture there are 4 rows of 5 eggs each, so there are  $4 \times 5 = 20$  eggs in each flat. Once students see this, they should decide to multiply by the number of flats. To help students understand this, you may want to have them make a few layers of smaller arrays of objects. They should see that since each layer contains the same number of objects, they may multiply rather than add.

You may want to have students trace around the grocery items on large sheets of newsprint and construct a simulated box.



$$6 \times 20 = 120$$

In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

### Modeling a Sample Problem

You may want to use empty egg cartons to model how the students might approach a packing problem. As you investigate various arrangements of egg cartons, you might ask yourself aloud these questions: How many egg cartons should I place in a row? How many rows of egg cartons should there be? How many layers of egg cartons should there be? Must the egg cartons be laid flat?

As the egg cartons are placed in different arrangements, the length, width, and height of each arrangement could be measured and recorded in a chart like the one below.

If possible, you may want to weigh one full carton so that the total weight of each arrangement can be approximated.

### Background Information

Egg cartons are packed in crates with 15 or 30 cartons in a crate. Those with 15 egg cartons are arranged in 5 layers of 3 cartons. Those with 30 cartons are arranged in 5 layers with 2 rows of 3 cartons in each layer.

Dimensions			Number of cartons
Length	Width	Height	



## Objective 54

Multiply a one- or two-digit number and a multiple of 10, 100, or 1,000.

### Lesson Theme

Social Studies: Cities

### Materials

- Basic-Facts Chart (Teaching Aid B)
- Play Money
- Counting Sticks, Straws, or Pencils

## Introduction

**Using Concrete Materials** Have students bundle counting sticks, straws, pencils, or other objects into bundles of ten. Give each of four students a bundle of ten. Ask how many in all. [4 bundles of ten or 40] Then give each student 3 bundles of ten. Point out that there are  $4 \times 3$  or 12 bundles of ten. Ask how many there are in all. [120] Repeat this activity giving other students equal bundles of ten, such as 4 bundles each to 5 students.

## Using the Pages

**Teach** Read and discuss Example A. Use play money or 12 sheets of paper marked as 3 each of 1 dollar, 10 dollars, 100 dollars, and 1,000 dollars. Have each of 3 students display 1 dollar. Ask how much is being shown. [3 dollars] Write  $3 \times 1 = 3$  on the board. Repeat, having each of 3 students show 10 dollars, 100 dollars, and 1,000 dollars. Each time ask how much money is being shown; write on the board:  $3 \times 10 = 30$ ,  $3 \times 100 = 300$ , or  $3 \times 1,000 = 3,000$ . Ask students to look for patterns. [The number of zeros after 3 is the same as the number of zeros in 10, 100, and 1,000.]

**Mental Math** In Example C, students are shown how to use multiples of 10 to make certain multiplications easier.

**Error Analysis** Watch for students who omit a zero from the answer to exercises like  $6 \times 300$ . Have students making this error solve these exercises:  $5 \times 4$  [20],  $5 \times 40$  [200],  $5 \times 400$  [2,000], and  $5 \times 4,000$  [20,000] (See Reteaching 54.)

**Practice Estimation** Encourage students to examine their answers to determine whether or not they are reasonable. For example, 300 is not a reasonable answer to  $6 \times 500$  since 300 is less than 500.

**Mental Math** In Exercises 25-36, remind students to use the mental arithmetic strategy presented in Example C.

**Apply Problem Solving** Problem 39 involves subtraction. Problem 40 is a multiple-step problem.

## Multiplying Tens, Hundreds, and Thousands: Mental Math

- A.** The city hall has 4 stories. On the north side, there are 10 offices on each story. How many offices are on the north side?

Think of 4 groups of 10.

You can add.  $10 + 10 + 10 + 10 = 40$

Or, you can multiply.  $4 \times 10 = 40$   $4 \times 1 \text{ ten} = 4 \text{ tens}$

There are 40 offices on the north side of the city hall.



Compute mentally. Use your mind to save you time.

- B.** The patterns below show an easy way to multiply with multiples of 10, 100, or 1,000.

$$\begin{aligned} 8 \times 2 &= 16 \\ 8 \times 20 &= 160 \\ 8 \times 200 &= 1,600 \\ 8 \times 2,000 &= 16,000 \\ 5 \times 8 &= 40 \\ 5 \times 80 &= 400 \\ 5 \times 800 &= 4,000 \\ 5 \times 8,000 &= 40,000 \end{aligned}$$

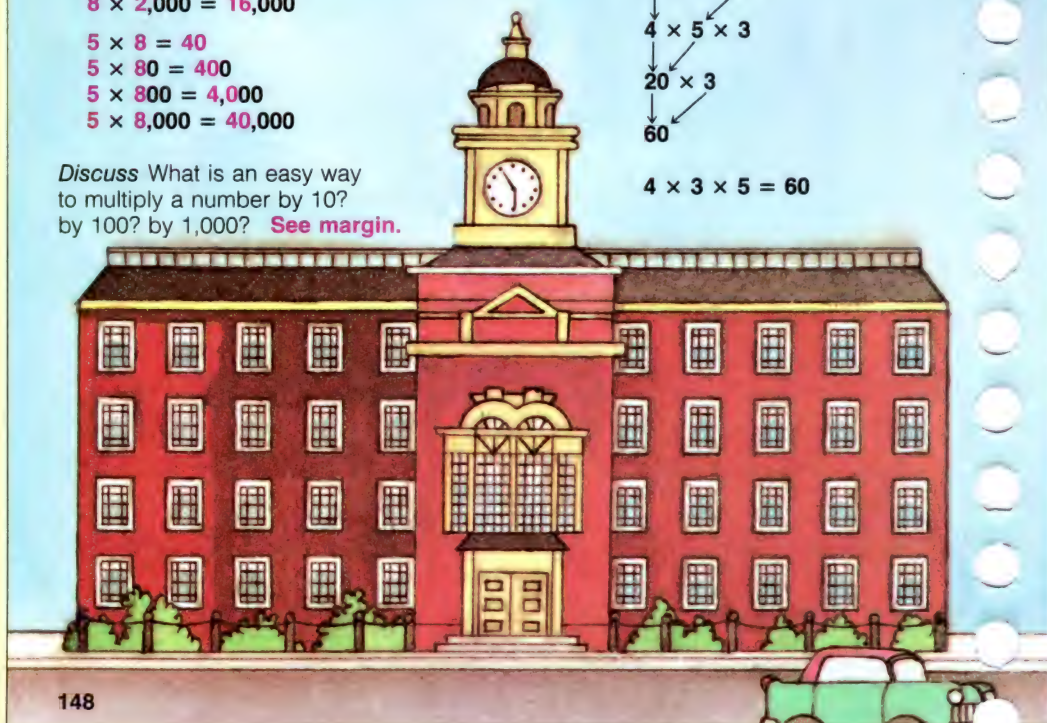
**Discuss** What is an easy way to multiply a number by 10? by 100? by 1,000? See margin.

- C.** Look for products that are multiples of 10 to make your multiplication easier.

Find  $4 \times 3 \times 5$ .

$$\begin{aligned} 4 \times 3 \times 5 &= 60 \\ 4 \times 5 \times 3 &= 60 \\ 20 \times 3 &= 60 \\ 60 &= 60 \end{aligned}$$

$$4 \times 3 \times 5 = 60$$



## Practice 54

**Multiple**

1. $7 \times 10 =$ <u>70</u>	2. $20 \times 5 =$ <u>100</u>
3. $9 \times 30 =$ <u>270</u>	4. $100 \times 13 =$ <u>1,300</u>
5. $10 \times 70 =$ <u>700</u>	6. $138 \times 10 =$ <u>1,380</u>
7. $100 \times 99 =$ <u>9,900</u>	8. $49 \times 100 =$ <u>4,900</u>
9. $18 \times 100 =$ <u>1,800</u>	10. $7 \times 200 =$ <u>1,400</u>
11. $86 \times 10 =$ <u>860</u>	12. $9 \times 800 =$ <u>7,200</u>
13. $700 \times 5 =$ <u>3,500</u>	14. $10 \times 100 =$ <u>1,000</u>
15. $100 \times 52 =$ <u>5,200</u>	16. $10 \times 21 =$ <u>210</u>
17. $400 \times 8 =$ <u>3,200</u>	18. $92 \times 10 =$ <u>920</u>
19. $15 \times 1,000 =$ <u>15,000</u>	20. $8 \times 3,000 =$ <u>24,000</u>
21. $1,000 \times 13 =$ <u>13,000</u>	22. $50 \times 1,000 =$ <u>50,000</u>

23. Complete the multiplication table.

$\times$	10	100	1,000
2	20	200	2,000
8	80	800	8,000
13	130	1,300	13,000
25	250	2,500	25,000
54	540	5,400	54,000

## Reteaching 54

**Find the pattern.**

$12 \times 1 = 12$	$2 \times 3 = 6$	
$12 \times 10 = 120$	$2 \times 30 = 60$	1 zero
$12 \times 100 = 1,200$	$2 \times 300 = 600$	2 zeros
$12 \times 1,000 = 12,000$	$2 \times 3,000 = 6,000$	3 zeros

**To multiply by 10 annex 1 zero.** **To multiply by 100 annex 2 zeros.** **To multiply by 1,000 annex 3 zeros.**

**Why did the twig sleep in the fireplace?**

**Multiply. Match each letter to its answer in the blank's below.**

1. $2 \times 10 =$ <u>20</u> E	2. $2 \times 100 =$ <u>200</u> L	3. $2 \times 1,000 =$ <u>2,000</u> T
4. $6 \times 10 =$ <u>60</u> A	5. $6 \times 100 =$ <u>600</u> S	6. $6 \times 1,000 =$ <u>6,000</u> P
7. $3 \times 30 =$ <u>90</u> E	8. $3 \times 300 =$ <u>900</u> G	9. $3 \times 3,000 =$ <u>9,000</u> K
10. $16 \times 10 =$ <u>160</u> L	11. $16 \times 100 =$ <u>1,600</u> E	12. $16 \times 1,000 =$ <u>16,000</u> L
13. $10 \times 65 =$ <u>650</u> O	14. $100 \times 23 =$ <u>2,300</u> I	15. $1,000 \times 4 =$ <u>4,000</u> O

**T O S L E E P**  
2,000 650 600 160 1,600 90 8,000

**L I K E A L O G**  
200 2,300 9,000 20 60 16,000 4,000 900



## Assignment Guide

basic 1–40 odd  
average 1–39  
enriched 1–40

**More Practice Set 54,**  
page 370

## Homework to do with others

**Mental Math** Have students ask 3 or more adults the answers to these exercises:  $68 \times 100$ ,  $490 \times 10$ , and  $3,000 \times 5$ . Tell each student to ask the people how they computed the answer. Tell students to record the responses. Have every student prepare a brief report and present it during class.

## Follow-Up

**Extra Practice** Make up a set of cards with the numbers 1, 10, 100, and 1,000. Make up a second set of cards with various one- or two-digit numbers. Hold up one card from each set and have students give the product.

**Reteaching** You may want to have students solve exercises not previously assigned or exercises incorrectly solved by rewriting each exercise using words first.  $9 \times 300 = 9 \times 3 \text{ hundred} = 27 \text{ hundred}$ . So  $9 \times 300 = 2,700$ .

**Enrichment** Have students put zeros in equations like the following to make them correct. More than one answer is possible.

- $7 \times 4 = 2,800$   
[ $700 \times 4$ ,  $70 \times 40$ ,  $7 \times 400$ ]
- $9 \times 7 = 6,300$   
[ $900 \times 7$ ,  $90 \times 70$ ,  $9 \times 700$ ]

## Computer Assisted Instruction

Mathematics Courseware Series  
• Multiplication 2, Activities 1, 2

## Daily Maintenance

**Mental Math** Encourage students to do these exercises mentally.

- $7 \times 3$  [21]
- $8 \times 9$  [72]
- $6 \times 4$  [24]
- $6 \times 9$  [54]
- $8 \times 8$  [64]
- $6 \times 7$  [42]
- $3 \times 9$  [27]
- $9 \times 7$  [63]
- $4 \times 9$  [36]
- $5 \times 8$  [40]

**Answers, page 148**

**Discuss**

**Annex 1 zero, 2 zeros, or 3 zeros.**

## Try Multiply.

a.  $7 \times 20$   
**140**

b.  $34 \times 100$   
**3,400**

c.  $5 \times 4,000$   
**20,000**

d.  $4 \times 7 \times 5$   
**140**



## Practice Multiply.

1.  $8 \times 1$   
**8**

2.  $8 \times 10$   
**80**

3.  $8 \times 100$   
**800**

4.  $8 \times 1,000$   
**8,000**

5.  $3 \times 10$   
**30**

6.  $6 \times 100$   
**600**

7.  $9 \times 100$   
**900**

8.  $5 \times 1,000$   
**5,000**

9.  $46 \times 1$   
**46**

10.  $46 \times 10$   
**460**

11.  $46 \times 100$   
**4,600**

12.  $46 \times 1,000$   
**46,000**

13.  $3 \times 4$   
**12**

14.  $3 \times 40$   
**120**

15.  $3 \times 400$   
**1,200**

16.  $3 \times 4,000$   
**12,000**

17.  $6 \times 5$   
**30**

18.  $6 \times 50$   
**300**

19.  $6 \times 500$   
**3,000**

20.  $6 \times 5,000$   
**30,000**

21.  $9 \times 10$   
**90**

22.  $9 \times 20$   
**180**

23.  $9 \times 30$   
**270**

24.  $9 \times 3,000$   
**27,000**

25.  $7 \times 5 \times 6$   
**210**

26.  $8 \times 5 \times 9$   
**360**

27.  $8 \times 7 \times 5$   
**280**

28.  $5 \times 2 \times 7$   
**70**

29.  $5 \times 9 \times 6$   
**270**

30.  $5 \times 5 \times 4$   
**100**

31.  $2 \times 8 \times 5$   
**80**

32.  $4 \times 4 \times 5$   
**80**

33.  $9 \times 5 \times 4$   
**180**

34.  $2 \times 9 \times 5$   
**90**

35.  $5 \times 8 \times 8$   
**320**

36.  $6 \times 3 \times 5$   
**90**

## Apply Solve each problem.

37. There are 20 offices on the first floor of the city hall. 4 people work in each of these offices. How many people work in the offices on the first floor?  
**80 people**

39. A department store has 20 display windows. 9 of them have been decorated for Spring. How many windows are not decorated for Spring?  
**11 windows**

38. An office building has 8 stories. Each story has 30 windows. How many windows does this building have?  
**240 windows**

40. In an office building, 10 offices have 2 telephones each, and 20 offices have 3 telephones each. How many telephones do these offices have in all?  
**80 telephones**



More Practice Set 54, page 370 **149**

## Enrichment 54

Name \_\_\_\_\_ E54

**Flow Charts IV**

Follow these flow charts. Write your final answers in the circles.

- 7 → +5 → Greater than 1,000? → yes (9,553)  
no → ×10 → -27
- 34 → ×100 → Greater than 10,000? → yes (31,850)  
no → -215 → ×10
- 87 → -49 → Greater than 100,000? → yes (340,558)  
no → ×100 → -342

## Additional Resource 54

Name \_\_\_\_\_ Additional Resource 54

**Mental Math Powerful Tens**

Multiplying by powers of ten is easy. Here's how:

17 × 100 = 1,700

- Write 17. 17
- Write as many 0s as are in the power of ten. 1,700

Multiply mentally

- $23 \times 10 = 230$
- $23 \times 1,000 = 23,000$
- $14 \times 100 = 1,400$
- $14 \times 1,000 = 14,000$
- $70 \times 10 = 700$
- $70 \times 1,000 = 70,000$
- $7 \times 10 \times 10 = 700$
- $7 \times 100 \times 10 = 7,000$
- $36 \times 100 = 3,600$
- $36 \times 100,000 = 3,600,000$
- $360 \times 10 = 3,600$
- $360 \times 1,000 = 360,000$
- $36 \times 1,000,000,000 = 36,000,000,000$
- $23 \times 100 = 2,300$
- $23 \times 10,000 = 230,000$
- $14 \times 10,000 = 140,000$
- $14 \times 10 = 140$
- $70 \times 100 = 7,000$
- $70 \times 10,000 = 700,000$
- $70 \times 10 \times 100 = 70,000$
- $70 \times 10 \times 1,000 = 700,000$
- $36 \times 1,000 = 36,000$
- $36 \times 1,000,000 = 36,000,000$
- $360 \times 100 = 36,000$
- $360 \times 100,000 = 36,000,000$



## Objective 55

Multiply a two-, three-, or four-digit number and a one-digit number with no renaming.

### Lesson Theme

Careers: Firefighter

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Place-Value Charts (Teaching Aid C)

### Introduction

**Motivational Situation** Ask students if they can think of ways firefighters could use mathematics in making reports for their jobs. [Minutes to reach a fire, number of fires monthly]

**Using Concrete Materials** Show students how to use ten-sticks and unit-squares to multiply. Write  $3 \times 21$  on the chalkboard. Display three groups of two ten-sticks and one unit-square each. Point out that this represents  $3 \times 21$ . Mix the materials together. Ask students how many ones there are. [3] Then ask them how many tens there are. [6] Write  $3 \times 21 = 63$  on the chalkboard.

In this lesson, students use concrete materials to multiply. By using a "hands-on" approach, students should "see" that multiplication is a combining of equal groups. They should also "see" that multiplication is repeated addition. An algorithm is presented in the next lesson.

### Using the Pages

**Teach** Allow students to work and discuss Example A on their own. Be sure they record their estimates. You might want to check for understanding in each group by asking members to show how they used ten-sticks and unit-squares to display and combine 3 groups of 42.

For Example B, students should round 72 to 70 in order to estimate.

**Try Estimation** Have students record each estimate before they do each exercise.

**Apply Problem Solving** Stress that students multiply when they join equal groups to find a total. Have students explain how they could use mental math to solve Problem 11. [Multiply 3 times 4; then write as many zeros as are in 400.]

## Multiplication: No Renaming



In this book you will often be asked to work in groups. Turn to pages 438–441 for instructions on group work.

- A. Career** Tom Amber is a fireman. Last week he spoke about fire prevention to 3 groups of students. There were 42 students in each group. How many students did he speak to last week?

Work in groups of 4.

Find  $3 \times 42$ . Use rounding to estimate the answer.

$$3 \times 40 = 120$$

Use place-value materials to find the actual answer.

Show 3 groups of 42.

How many tens are there in all? **12 tens**

How many ones? **6 ones**

Use your place-value materials to show the product in standard form. What is  $3 \times 42$ ? **126**

Tom Amber spoke to **126** students last week.

Is your answer reasonable? Why? **Yes, because it is close to the estimated product.**

**150**

- B.** Continue to work in your group.

Find  $4 \times 72$ .

Estimate the product before you begin working with your place-value materials.

$$4 \times 70 = 280$$

What is  $4 \times 72$ ?

**288**

Is your answer close to the estimated product? **Yes**  
Is your answer reasonable? **Yes**

Use Practice 55, Reteaching 55, and Enrichment 55 after page 153. See note at the top of page 151.

### Practice 55

Name \_\_\_\_\_ P55

Multiply

1. $\begin{array}{r} 13 \\ \times 2 \\ \hline 26 \end{array}$	2. $\begin{array}{r} 21 \\ \times 3 \\ \hline 63 \end{array}$	3. $\begin{array}{r} 22 \\ \times 4 \\ \hline 88 \end{array}$	4. $\begin{array}{r} 11 \\ \times 7 \\ \hline 77 \end{array}$
5. $\begin{array}{r} 74 \\ \times 2 \\ \hline 148 \end{array}$	6. $\begin{array}{r} 61 \\ \times 6 \\ \hline 366 \end{array}$	7. $\begin{array}{r} 42 \\ \times 3 \\ \hline 126 \end{array}$	8. $\begin{array}{r} 83 \\ \times 2 \\ \hline 166 \end{array}$
9. $\begin{array}{r} 213 \\ \times 3 \\ \hline 639 \end{array}$	10. $\begin{array}{r} 432 \\ \times 2 \\ \hline 864 \end{array}$	11. $\begin{array}{r} 132 \\ \times 3 \\ \hline 396 \end{array}$	12. $\begin{array}{r} 611 \\ \times 6 \\ \hline 3,666 \end{array}$
13. $\begin{array}{r} 412 \\ \times 4 \\ \hline 1,648 \end{array}$	14. $\begin{array}{r} 934 \\ \times 2 \\ \hline 1,868 \end{array}$	15. $\begin{array}{r} 313 \\ \times 3 \\ \hline 939 \end{array}$	16. $\begin{array}{r} 521 \\ \times 4 \\ \hline 2,084 \end{array}$
17. $\begin{array}{r} 6212 \\ \times 4 \\ \hline 24,848 \end{array}$	18. $\begin{array}{r} 502 \\ \times 3 \\ \hline 1,506 \end{array}$	19. $\begin{array}{r} 2011 \\ \times 7 \\ \hline 14,077 \end{array}$	20. $\begin{array}{r} 540 \\ \times 2 \\ \hline 1,080 \end{array}$

Find each product. Multiply the number in the middle ring by the number in the center ring.

### Reteaching 55

Name \_\_\_\_\_ R55

Find  $3 \times 132$

Multiply the ones:  $3 \times 2 = 6$

Multiply the tens:  $3 \times 3 \text{ tens} = 9 \text{ tens}$

Multiply the hundreds:  $3 \times 1 \text{ hundred} = 3 \text{ hundreds}$

3  $\times$  132 = 396

A group of fish is a school. What is a group of toads called?

Multiply. Match each letter to its answer in the blank below. Some answers are not used.

1. $\begin{array}{r} 41 \\ \times 3 \\ \hline 123 \end{array}$ H	2. $\begin{array}{r} 312 \\ \times 3 \\ \hline 936 \end{array}$ M
3. $\begin{array}{r} 122 \\ \times 3 \\ \hline 366 \end{array}$ A	4. $\begin{array}{r} 41 \\ \times 3 \\ \hline 123 \end{array}$ Y
5. $\begin{array}{r} 423 \\ \times 2 \\ \hline 846 \end{array}$ N	6. $\begin{array}{r} 212 \\ \times 3 \\ \hline 636 \end{array}$ C
7. $\begin{array}{r} 512 \\ \times 3 \\ \hline 1536 \end{array}$	8. $\begin{array}{r} 214 \\ \times 2 \\ \hline 428 \end{array}$ R
9. $\begin{array}{r} 71 \\ \times 6 \\ \hline 426 \end{array}$ O	10. $\begin{array}{r} 633 \\ \times 3 \\ \hline 1899 \end{array}$ K

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z



## Assignment Guide

basic 1–13  
average 1–13  
enriched 1–13

Note: Pages 150–153 contain a 2-lesson sequence that moves from concrete to symbolic. First use the student pages for both lessons. Then go back and assign ancillary pages and More Practice sets for the lessons.

**More Practice Set 55,**  
page 371

## Follow-Up

**Extra Practice** Have students do the following multiplication puzzle.

Across

1.  $3 \times 81$
3.  $9 \times 7$
4.  $9 \times 61$

Down

1.  $5 \times 51$
2.  $3 \times 123$

<sup>1</sup> [2]	[4]	<sup>2</sup> [3]	
[5]		<sup>3</sup> [6]	[3]
<sup>4</sup> [5]	[4]	[9]	

## Reteaching Using Concrete Materials

Have students use ten-sticks and unit-squares to do the following exercises.

$$\begin{array}{r} 32 \\ \times 4 \\ \hline [128] \end{array} \quad \begin{array}{r} 33 \\ \times 3 \\ \hline [99] \end{array} \quad \begin{array}{r} 42 \\ \times 4 \\ \hline [168] \end{array} \quad \begin{array}{r} 12 \\ \times 3 \\ \hline [36] \end{array}$$

**Enrichment** Have students find the missing digits.

$$\begin{array}{r} [3] [2] [1] \\ \times \quad \quad 4 \\ \hline 1, 2 \quad 8 \quad 4 \end{array} \quad \begin{array}{r} [6.] [3] [1] [2] \\ \times \quad \quad \quad 3 \\ \hline 1 \quad 8, \quad 9 \quad 3 \quad 6 \end{array}$$

## Computer Assisted Instruction

Mathematics Courseware Series

- Multiplication 2, Activity 3

## Daily Maintenance

First multiply and then add.

1.  $5 \times 4 + 3$  [23]
2.  $9 \times 6 + 8$  [62]
3.  $4 \times 9 + 1$  [37]
4.  $6 \times 3 + 4$  [22]
5.  $7 \times 2 + 5$  [19]

**Answers, page 151**

12. Answers will vary. A sample is given.

$15 \times 7$  means 15 groups of 7. If you mix the 15 groups into 1 group, it is the same as adding

$$7 + 7 + \dots + 7 = 105$$

15 times

13. Put 2 groups of 49 counters into 1 group. Count groups of 10 counters. There are 9 groups of 10 with 8 ones left over. This is 98 in standard form.

**Try** Multiply. Work in groups. First estimate the product. Then use place-value materials to find the actual answer. For each exercise, check if the actual answer is close to the estimate. Is your answer reasonable? Why or why not?

**Estimated answers are in parentheses.**

- a.  $\begin{array}{r} 21 \\ \times 3 \\ \hline 63 \end{array}$  (60)
- b.  $\begin{array}{r} 83 \times 2 \\ 166 \end{array}$  (160)
- c.  $\begin{array}{r} 432 \\ \times 2 \\ \hline 864 \end{array}$  (800)
- d.  $\begin{array}{r} 221 \times 4 \\ 884 \end{array}$  (800)

**Practice** Work in groups. Use place-value materials to find each product.

1.  $\begin{array}{r} 31 \\ \times 2 \\ \hline 62 \end{array}$
2.  $\begin{array}{r} 22 \\ \times 4 \\ \hline 88 \end{array}$
3.  $\begin{array}{r} 62 \\ \times 3 \\ \hline 186 \end{array}$
4.  $\begin{array}{r} 40 \\ \times 7 \\ \hline 280 \end{array}$
5.  $\begin{array}{r} 93 \\ \times 2 \\ \hline 186 \end{array}$
6.  $60 \times 8$  480
7.  $31 \times 6$  186
8.  $112 \times 4$  448
9.  $333 \times 2$  666
10.  $301 \times 3$  903

**Apply** Solve each problem.

11. On the fire truck, there were 3 hoses, each 400 feet long. If these hoses were hooked together, how far would they reach?  
**1,200 feet**
12. You want to explain multiplication to a younger student who has only studied addition. How would you explain that  $15 \times 7$  equals 105, using addition? **See margin.**
13. Use your place-value materials to find  $2 \times 49$ . Explain how you got your answer.  
**98; See margin.**


More Practice Set 55, page 371 151

## Enrichment 55

Name: \_\_\_\_\_ E55

**Multiplication Puzzle**

Fill in the empty boxes to make every number sentence true.



$211 \times 3 = 633$   
 $101 + 241 = 342$   
 $212 \times 4 = 848$   
 $3 \times 844 = 2532$   
 $424 + 81 = 505$   
 $684$   
 $636$   
 $201$   
 $2 \times 123 = 246$   
 $122 \times 4 = 488$   
 $3$   
 $121 \times 3 = 363$   
 $3$   
 $804 - 435 = 369$   
 $125$   
 $319$   
 $366$   
 $341 \times 2 = 682$

## Additional Resource 55

Name: \_\_\_\_\_ Additional Resource 55

**Maintenance**

Add, subtract, or multiply.

1.  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$
2.  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$
3.  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$
4.  $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$
5.  $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$
6.  $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$
7.  $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$
8.  $\begin{array}{r} 14 \\ \times 5 \\ \hline 70 \end{array}$
9.  $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$
10.  $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$
11.  $\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$
12.  $\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$
13.  $\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$
14.  $\begin{array}{r} 15 \\ \times 7 \\ \hline 105 \end{array}$
15.  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$
16.  $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$
17.  $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$
18.  $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$
19.  $\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$
20.  $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$
21.  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$
22.  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$
23.  $\begin{array}{r} 11 \\ \times 7 \\ \hline 77 \end{array}$
24.  $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$
25.  $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$
26.  $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$
27.  $\begin{array}{r} 15 \\ \times 7 \\ \hline 105 \end{array}$
28.  $\begin{array}{r} 18 \\ \times 9 \\ \hline 162 \end{array}$
29.  $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
30.  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$
31.  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
32.  $\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$
33.  $\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$
34.  $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$
35.  $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$



## Objective 56 (Target Objective)

Multiply a two-, three-, or four-digit number and a one-digit number with one renaming.

### Lesson Theme

Social Studies: City Fire Department

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Review renaming.

Have students display 53 using ten-sticks and unit-squares. Discuss various ways of recording this number. [53,  $50 + 3$ , 5 tens 3 ones] Repeat with 72. [72,  $70 + 2$ , 7 tens 2 ones]

In this lesson, students continue to use concrete materials to multiply. But now the examples and exercises include multiplication with one renaming. The algorithm is given in Exercise 5.

## Using the Pages

**Teach** Discuss Example A in class after students have worked it on their own.

For Example B, students round 314 to 300 to get an estimated product of 1,500. Check that each group has made five groups of three hundred-squares, one ten-stick, and four unit-squares. Students will recognize that they can rename a total of 20 ones as 2 tens 0 ones, so that they have 7 tens in all. Point out that 1,570 is close to the estimate.

**Try** Tell students that if they round the multiplicand up, the estimate will be greater than the actual product. If they round it down, the estimated product will be less than the actual product. Ask how they could use these estimates to check for a reasonable answer. [The answer will fall between the two estimates.]

**Practice Error Analysis** Ask students who are having difficulties to come to your desk. Then, write  $4 \times 23$  on the chalkboard. Display 4 groups of 23. After you combine groups, ask how many ones there are. [12] Then ask how many tens and ones there are. [9 tens and 2 ones] Explain that this is 92 in standard form. Write on the chalkboard:

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 12 \\ 80 \\ \hline 92 \end{array}$$

$4 \times 3 = 1 \text{ ten } 2 \text{ ones}$   
 $4 \times 2 \text{ tens} = 8 \text{ tens}$

(Continued on page 153.)

## Multiplication: One Renaming

- A.** There are 3 fire stations in the city. Each fire station has 24 firefighters. How many firefighters are there?

Find  $3 \times 24$ . Estimate the product.  $3 \times 24$  is about **60**

Work with two other students. Use place-value materials to show 3 groups of 24. Mix the groups together to make one group. Are there enough ones to exchange for another ten? How many tens are there in all? Show the number in standard form.

What is  $3 \times 24$ ? **Yes; 7; 72; 72**

There are **72** firefighters. **72**

- B.** Continue to work in your group. Use place-value materials to find  $5 \times 314$ . First estimate the product.  **$5 \times 300 = 1,500$**  Keep a step-by-step record of how you used your place-value materials to find the product. **1,570** Is your answer reasonable? Why or why not?

Compare the steps your group used to find the product to the steps used by another group. Are they the same? If not, take turns explaining each method to the other group.

**Try** Work in groups. Estimate the answer to each exercise. Then use place-value materials to find the actual product. **Estimates are in parentheses.**

a.  $\begin{array}{r} 25 \\ \times 9 \\ \hline 225 \end{array}$  (270)

b.  $\begin{array}{r} 44 \\ \times 7 \\ \hline 308 \end{array}$  (280)

c.  $\begin{array}{r} 42 \\ \times 8 \\ \hline 336 \end{array}$  (320)

d.  $\begin{array}{r} 314 \\ \times 6 \\ \hline 1,884 \end{array}$  (1,800)

e.  $8 \times 421$   
**3,368 (3,200)**

f.  $382 \times 4$   
**1,528 (1,600)**

- g. Each of you choose at least one of the Exercises a–f and explain to the others why your answer is reasonable. **Answers will vary.**

**Practice** Work in groups. Estimate the answer to each exercise. Then use place-value materials to find the actual product. **Estimates are in parentheses.**

1.  $\begin{array}{r} 17 \\ \times 4 \\ \hline 68 \end{array}$  (80)

2.  $\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$  (60)

3.  $\begin{array}{r} 64 \\ \times 7 \\ \hline 448 \end{array}$  (420)

4.  $\begin{array}{r} 58 \\ \times 5 \\ \hline 290 \end{array}$  (300)

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See Using the Pages for a discussion of these examples.



Use Practice 56, Reteaching 56, and Enrichment 56 after page 153. See note at the top of page 151.

## Practice 56

Normal

How did Thomas Edison feel when he invented the light bulb?

To find out, multiply. Then find each answer in the code below. Write the letter for that exercise in the blank above the answer.

1.  $\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$  W

2.  $\begin{array}{r} 23 \\ \times 4 \\ \hline 92 \end{array}$  I

3.  $\begin{array}{r} 17 \\ \times 4 \\ \hline 68 \end{array}$  E

4.  $\begin{array}{r} 12 \\ \times 8 \\ \hline 96 \end{array}$  I

5.  $\begin{array}{r} 435 \\ \times 2 \\ \hline 870 \end{array}$  O

6.  $\begin{array}{r} 54 \\ \times 6 \\ \hline 324 \end{array}$  E

7.  $\begin{array}{r} 25 \\ \times 5 \\ \hline 125 \end{array}$  A

8.  $\begin{array}{r} 129 \\ \times 3 \\ \hline 387 \end{array}$  R

9.  $\begin{array}{r} 43 \\ \times 5 \\ \hline 215 \end{array}$  D

10.  $\begin{array}{r} 151 \\ \times 9 \\ \hline 1,359 \end{array}$  D

11.  $\begin{array}{r} 34 \\ \times 6 \\ \hline 204 \end{array}$  T

12.  $\begin{array}{r} 28 \\ \times 4 \\ \hline 112 \end{array}$  D

13.  $\begin{array}{r} 512 \\ \times 7 \\ \hline 3,584 \end{array}$  S

14.  $\begin{array}{r} 42 \\ \times 9 \\ \hline 378 \end{array}$  M

15.  $\begin{array}{r} 317 \\ \times 3 \\ \hline 951 \end{array}$  S

16.  $\begin{array}{r} 614 \\ \times 5 \\ \hline 3,070 \end{array}$  H

17.  $\begin{array}{r} 7611 \\ \times 6 \\ \hline 45,666 \end{array}$  N

18.  $\begin{array}{r} 22 \\ \times 7 \\ \hline 154 \end{array}$  E

19.  $\begin{array}{r} 66 \\ \times 4 \\ \hline 264 \end{array}$  L

20.  $\begin{array}{r} 1,310 \\ \times 6 \\ \hline 7,860 \end{array}$  G

**M R E D I S O N**  
378 387 154 112 951 970 45,666

**W A S**  
72 125 3,584

**D E L I G H T E D**  
1,359 324 264 92 7,860 3,070 204 68 215

## Reteaching 56

Normal

Find  $2 \times 248$

Multiply the ones:  $2 \times 8 = 16$

Multiply the tens:  $2 \times 4 \text{ tens} = 8 \text{ tens}$

Multiply the hundreds:  $2 \times 2 \text{ hundreds} = 4 \text{ hundreds}$

Show 1 ten 6 ones.

Show 9 tens.

Show 4 hundreds.

What country gave women the right to vote in 1893?

Multiply. Match each letter to its answer in the blanks below.

1. hundreds, tens, ones:  $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$  D

2. hundreds, tens, ones:  $\begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array}$  N

3.  $\begin{array}{r} 131 \\ \times 5 \\ \hline 655 \end{array}$  L

4.  $\begin{array}{r} 136 \\ \times 2 \\ \hline 272 \end{array}$  N

5.  $\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \end{array}$  W

6.  $\begin{array}{r} 327 \\ \times 3 \\ \hline 981 \end{array}$  A

7.  $\begin{array}{r} 527 \\ \times 3 \\ \hline 1,581 \end{array}$  E

8.  $\begin{array}{r} 513 \\ \times 7 \\ \hline 3,591 \end{array}$  A

9.  $\begin{array}{r} 412 \\ \times 8 \\ \hline 3,296 \end{array}$  E

10.  $\begin{array}{r} 341 \\ \times 4 \\ \hline 1,364 \end{array}$  Z

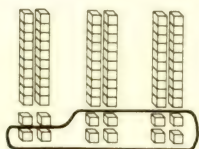
**N E W Z E A L A N D**  
688 1,581 81 1,364 3,296 981 655 3,591 272 634



5. Here is a way to record your work in Example A. Use the pictures to explain each step.

Step 2  
Multiply the ones.

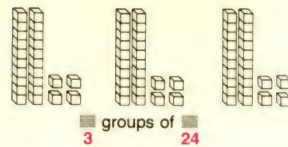
$$\begin{array}{r} 1 \\ 24 \\ \times 3 \\ \hline 2 \end{array}$$



$3 \times 4$  ones = 12 ones  
This is how many tens and ones?  
1 ten and 2 ones

Step 1

$$\begin{array}{r} 24 \\ \times 3 \\ \hline \end{array}$$



Step 3  
Multiply the tens.

$$\begin{array}{r} 1 \\ 24 \\ \times 3 \\ \hline 72 \end{array}$$



$3 \times 2$  tens = 6 tens  
How many tens are there in all?  
7 tens

Multiply. Use place-value materials and record your work.

6.  $\begin{array}{r} 81 \\ \times 8 \\ \hline 648 \end{array}$

7.  $\begin{array}{r} 39 \\ \times 2 \\ \hline 78 \end{array}$

8.  $\begin{array}{r} 113 \\ \times 5 \\ \hline 565 \end{array}$

9.  $\begin{array}{r} 627 \\ \times 3 \\ \hline 1,881 \end{array}$

10.  $\begin{array}{r} 517 \\ \times 4 \\ \hline 2,068 \end{array}$

11.  $\begin{array}{r} 381 \\ \times 5 \\ \hline 1,905 \end{array}$

12.  $\begin{array}{r} 462 \\ \times 4 \\ \hline 1,848 \end{array}$

13.  $\begin{array}{r} 832 \\ \times 3 \\ \hline 2,496 \end{array}$

14.  $\begin{array}{r} 581 \\ \times 6 \\ \hline 3,486 \end{array}$

15.  $\begin{array}{r} 1,217 \\ \times 4 \\ \hline 4,868 \end{array}$

Find each product without using place-value materials.

16.  $\begin{array}{r} 219 \\ \times 3 \\ \hline 657 \end{array}$

17.  $\begin{array}{r} 3,151 \\ \times 5 \\ \hline 15,755 \end{array}$

18.  $\begin{array}{r} 741 \\ \times 5 \\ \hline 3,705 \end{array}$

19.  $\begin{array}{r} 982 \\ \times 4 \\ \hline 3,928 \end{array}$

20.  $\begin{array}{r} 5,211 \\ \times 7 \\ \hline 36,477 \end{array}$

21.  $8 \times 37$   
**296**

22.  $45 \times 9$   
**405**

23.  $6 \times 47$   
**282**

24.  $615 \times 2$   
**1,230**

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.

25. Last week, firefighter Diana Ortega worked 3 shifts of 24 hours each. Did she work more or less than 75 hours last week?

**Less; E**

27. Last year, Stations A, B, and C had 874 calls, 937 calls, and 629 calls. How many calls did the stations have in all?

**2,440 calls; C**

26. Each of the 9 fire stations has 15 bunks for its firefighters. How many bunks are there in all the fire stations?

**135 bunks; P**

28. If 450 feet of 3-inch wide hose is hooked up to 300 feet of 4-inch wide hose, will the hose reach 800 feet?

**No; M**

More Practice Set 56, page 371 **153**

## Assignment Guide

basic 1–5, 6–24 odd, 25–28  
average 1–5, 6–24 even, 25–28  
enriched 1–5, 16–24, 25–28

**More Practice Set 56,**  
**page 371**

(Continued from page 152.)

Next to it write:

$$\begin{array}{r} 1 \\ 23 \\ \times 4 \\ \hline 92 \end{array}$$

Ask students to explain the steps.

**Apply Problem Solving** Encourage students to restate each problem in their own words. Problem 27 involves addition. Problem 28 has too much information.

## Follow-Up

**Extra Practice** Use two number cubes—one marked with one-digit numbers and one marked with two-digit numbers. Have students take turns tossing the number cubes and multiplying the numbers that appear.

**Reteaching** Here is an alternate approach that some students may find easier. Have students fill in missing digits.

$$\begin{array}{r} 1. \quad 30 + 5 \\ \times 7 \\ \hline 210 + [3] [5] \end{array}$$

$$\begin{array}{r} 35 \\ \times 7 \\ \hline 3 \ 5 \\ + [2] [1] [0] \\ \hline [2] [4] [5] \end{array}$$

$$\begin{array}{r} 2. \quad 20 + 9 \\ \times 4 \\ \hline [8] [0] + 36 \end{array}$$

$$\begin{array}{r} 29 \\ \times 4 \\ \hline [3] [6] \\ + 8 \ 0 \\ \hline [1] [1] [6] \end{array}$$

$$\begin{array}{r} 3. \quad 43 \\ \times 6 \\ \hline [1] [8] \\ + 2 \ 4 \ 0 \\ \hline [2] [5] [8] \end{array}$$

$$\begin{array}{r} [1] \\ 43 \\ \times 6 \\ \hline [2] [5] 8 \end{array}$$

## Computer Assisted Instruction

Mathematics Courseware Series

• Multiplication 2, Activities 4, 5

## Daily Maintenance

First multiply and then add.

1.  $7 \times 4 + 2$  [30]

2.  $3 \times 8 + 2$  [26]

3.  $5 \times 9 + 2$  [47]

4.  $9 \times 3 + 8$  [35]

5.  $4 \times 4 + 3$  [19]

6.  $7 \times 8 + 2$  [58]

## Enrichment 56

Name: \_\_\_\_\_ E56

**Puzzle Boxes**

Multiply across and add down to complete these puzzle boxes.

3	$\times$	141	=	423
+			+	
5	$\times$	141	=	705
=			=	
8	$\times$	141	=	1,128

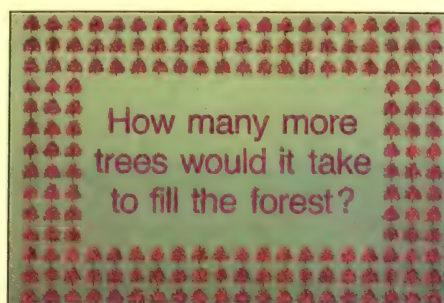
4	$\times$	214	=	856
+			+	
3	$\times$	214	=	642
=			=	
7	$\times$	214	=	1,498

Now, find the missing numbers in these puzzle boxes.

4	$\times$	216	=	864
+			+	
2	$\times$	216	=	432
=			=	
6	$\times$	216	=	1,296

2	$\times$	151	=	302
+			+	
3	$\times$	151	=	453
=			=	
5	$\times$	151	=	755

## Additional Resource 56



## Math Poster Q Multiplication: One

**Renaming** It would take 112 more trees to fill the forest. To solve this problem, students should count the number of missing trees in one row and multiply by the number of rows that are missing. See *Answer Key and Notes for Teacher's Resource File* for extension activities.



## Objective 57

Solve problems by finding a pattern.

### Materials

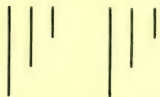
- Pattern Blocks (Math Kit)
- Basic-Facts Charts (Teaching Aid B)

## Introduction

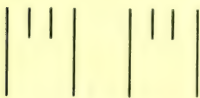
**Using Concrete Materials** Review the idea of patterns. Use pattern blocks to start the following pattern. Ask students to continue this pattern.



Then draw the following pattern on the board. Ask a student to come to the board and continue the pattern.



Now draw this pattern and ask students to continue the pattern.



Have students think of other patterns that they might make. Finally write the following numerical pattern on the board. Ask students to come to the board and continue the pattern.

1 3 5 3 1 3 5 [3, 1]

Display a multiplication table. Ask students to look for patterns in the multiplication table. [Consecutive numbers in first row and column, lower left to upper right diagonals such as 5, 8, 9, 8, 5]

## Using the Pages

**Try** After students have done Problems a and b, have them look at the table and find a pattern in the tens digits for the multiples of 9 through 10  $\times$  9. The tens digit of the product is one less than the number being multiplied by 9. A basic-fact strategy for multiplying by 9 is based on this observation and the pattern noted in Problem b, that the sum of the digits in each product is 9. Using these two patterns the product of  $7 \times 9$  has a tens digit of 6 ( $7 - 1$ ), and a ones digit of 3 ( $9 - 6 = 3$ ).

**Apply Problem Solving** Tell students that finding patterns often requires perseverance. Encourage them to be creative in looking for patterns.

If students are having difficulty getting started with Problem 8, suggest that they use this technique.

$$\begin{array}{cccccccc} 5 & 1 & 6 & 2 & 7 & 3 & 8 & 4 & 9 \\ \hline & -4 & +5 & -4 & +5 & -4 & +5 & -4 & +5 \end{array}$$

## Problem Solving Find a Pattern

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144



### Read

There are many number patterns formed by the factors and products in multiplication. Some patterns can be found in a multiplication table. What pattern is made by the sums of the digits in the products for the factor 3?

### Plan

Write the products shown in the table above for the factor 3. Where there is a 2-digit product, add the digits. Look for a pattern. Can a rule be used to find the next number? Do a group of numbers keep repeating?

### Solve

Products:	3	6	9	12	15	18	21	24	27	30	33	36
Sums of digits:	3	6	9	3	6	9	3	6	9	3	6	9

### Answer

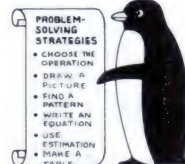
The pattern is 3, 6, 9.

### Look Back

Be sure you wrote the products in order and added correctly.

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YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.



## Practice 57

Name: \_\_\_\_\_ P57

Here is a portion of a multiplication table. Look at the squares below. They have been taken from the table.

1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

In the first blank, write the sum of the first number and the third number. In the second blank, write the value of two times the middle number.

1.  $\begin{array}{|c|c|c|} \hline 6 & 8 & 10 \\ \hline \end{array}$   $\frac{16}{40}$   $\frac{16}{40}$  2.  $\begin{array}{|c|c|c|} \hline 5 & 10 & 15 \\ \hline \end{array}$   $\frac{20}{60}$   $\frac{20}{60}$

3.  $\begin{array}{|c|c|c|} \hline 16 & 20 & 24 \\ \hline \end{array}$   $\frac{40}{60}$   $\frac{40}{60}$  4.  $\begin{array}{|c|c|c|} \hline 24 & 30 & 36 \\ \hline \end{array}$   $\frac{60}{60}$   $\frac{60}{60}$

5. Select 3 other consecutive squares from the table. See if the pattern works.  $\begin{array}{|c|c|c|} \hline & & \\ \hline \end{array}$  Answers will vary.

6. Select 3 consecutive squares from a column. See if the pattern works.  $\begin{array}{|c|} \hline \\ \hline \end{array}$

7. Does the pattern seem to work for any three consecutive squares in the table? **Yes**

For the following exercises, write the sum of the first, second, fourth, and fifth numbers. In the second blank, write the value of four times the middle number.

8.  $\begin{array}{|c|c|c|c|c|} \hline 3 & 6 & 9 & 12 & 15 \\ \hline \end{array}$   $\frac{36}{96}$   $\frac{36}{96}$

9.  $\begin{array}{|c|c|c|c|c|} \hline 12 & 18 & 24 & 30 & 36 \\ \hline \end{array}$   $\frac{96}{96}$   $\frac{96}{96}$

10. Select 5 other consecutive squares from the table. See if the pattern works.  $\begin{array}{|c|c|c|c|c|} \hline & & & & \\ \hline \end{array}$  Answers will vary.

11. Does the pattern seem to work for any 5 consecutive numbers in the table? **Yes**

## Reteaching 57

Name: \_\_\_\_\_ R57

1. Write the multiplication facts for 6.

$\frac{1}{6} \times \frac{2}{6}$	$\frac{2}{6} \times \frac{3}{6}$	$\frac{3}{6} \times \frac{4}{6}$	$\frac{4}{6} \times \frac{5}{6}$	$\frac{5}{6} \times \frac{6}{6}$	$\frac{6}{6} \times \frac{7}{6}$	$\frac{7}{6} \times \frac{8}{6}$	$\frac{8}{6} \times \frac{9}{6}$
6	12	18	24	30	36	42	48

Look at the ones digit in each answer. The pattern is 6, 2, 8, 4, 0, 6, 2, 8, 4, 0, 6. means goes on and on.

2. Now add the ones digit and the tens digit for each product.

$\frac{6}{6} + \frac{2}{12}$	$\frac{8}{18}$	$\frac{4}{24}$	$\frac{0}{30}$	$\frac{6}{36}$	$\frac{2}{42}$	$\frac{8}{48}$	$\frac{4}{54}$
6	3	9	6	3	9	6	3

If the digits have a 2-digit sum, add again to get a 1-digit sum. The pattern is 6, 3, 9, 6, 3, 9, 6, 3, 9.

3. Write the multiplication facts for 2.

$\frac{1}{2} \times \frac{2}{2}$	$\frac{2}{2} \times \frac{3}{2}$	$\frac{3}{2} \times \frac{4}{2}$	$\frac{4}{2} \times \frac{5}{2}$	$\frac{5}{2} \times \frac{6}{2}$	$\frac{6}{2} \times \frac{7}{2}$	$\frac{7}{2} \times \frac{8}{2}$	$\frac{8}{2} \times \frac{9}{2}$
2	4	6	8	10	12	14	16

Look at the ones digit in each answer. The pattern is 2, 4, 6, 8, 0, 2, 4, 6, 8, 0, 2.

4. Now add the ones digit and the tens digit for each product.

$\frac{2}{2} + \frac{4}{4}$	$\frac{6}{6}$	$\frac{8}{8}$	$\frac{0}{10}$	$\frac{2}{12}$	$\frac{4}{14}$	$\frac{6}{16}$	$\frac{8}{18}$
2	4	6	8	2	4	6	8

The pattern is 2, 4, 6, 8, 2, 4, 6, 8, 2, 4, 6, 8.



**Try** Solve each problem.

In the products for the factor 9, what pattern is made by

- the ones digits?  
**9, 8, 7, 6, 5, 4, 3, 2, 1, 0**
- the sums of the digits? If the digits have a 2-digit sum, add again to get a 1-digit sum.  
**9**

**Apply** Solve each problem.

What pattern is made by the ones digits in

- the products for the factor 5?  
**5, 0**
- the products for the factor 4?  
**4, 8, 2, 6, 0**
- the products for the factor 8?  
**8, 6, 4, 2, 0**

In the products for the factor 11, what pattern is made by

- the ones digits?  
**1, 2, 3, 4, 5, 6, 7, 8, 9, 0**
- the sums of the digits? If there is a 2-digit sum, add again to get a 1-digit sum.  
**2, 4, 6, 8, 1, 3, 5, 7, 9**

In the products for the factor 12, what pattern is made by

- the ones digits?  
**2, 4, 6, 8, 0**
- the sums of the digits? If there is a 2-digit sum, add again to get a 1-digit sum.  
**3, 6, 9**
- In the products for the factor 5, what pattern is made by the sums of the digits?  
**5, 1, 6, 2, 7, 3, 8, 4, 9**

More Practice Set 57, page 372

## Calculator

This 2-by-2 square has been cut from a multiplication table. Notice the products of the numbers on the diagonals. They are the same.

2	3
4	6

$$2 \times 6 = 12$$

$$3 \times 4 = 12$$

Use your calculator to find out if this pattern is true for larger squares.

2	3	4
4	6	8
6	9	12

- $2 \times 6 \times 12 =$  **144**
- $4 \times 6 \times 6 =$  **144**

3	6	9	12
4	8	12	16
5	10	15	20
6	12	18	24

- $3 \times 8 \times 15 \times 24 =$  **8,640**
- $12 \times 12 \times 10 \times 6 =$  **8,640**

Are the products of the numbers on the diagonals equal for the

- 3-by-3 square above?  
**Yes**
- 4-by-4 square above?  
**Yes**
- Choose a 5-by-5 square on the multiplication table. Is the pattern true for this square?  
**Yes**

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## Assignment Guide

basic	1-5
average	1-7
enriched	1-8

**More Practice Set 57, page 372**

### Calculator, page 155

Have students continue to find products of the numbers on the diagonals for a 6-by-6 square and so on up to a 12-by-12 square. They will find that the products of the diagonals for each square are always equal.

### Follow-Up

**Enrichment** Have students use a basic-facts chart for multiplication to investigate patterns in the multiplication table which illustrate some of the properties of multiplication.

- Distributive Property** Have students look at the third column. The numbers which appear opposite 3, 5, and 8 are 9, 15, and 24. Notice that  $3 + 5 = 8$  and  $9 + 15 = 24$ . What numbers appear opposite 2, 4, and 6? [6, 12, 18] Does the same pattern hold? [Yes] Look in the fifth column. What numbers appear opposite 3, 4, and 7? [15, 20, 35] Does the pattern still hold? [Yes] Have students find another example of this pattern in another column. Have students investigate this pattern looking at numbers in rows below specific numbers.
- Commutative Property** Have students shade the squares in the major diagonal from upper left to lower right (1, 4, 9, ...). Have students find identical numbers on either side of this diagonal. Have students shade all 24s, for example, in another color. Repeat with 4 or 5 other numbers and colors. Ask what patterns are formed by the shading. [The colored squares will form a symmetric pattern about the diagonal.]

### Daily Maintenance


**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Ask several students to give their reasons for their choices.

- $48 + 27$  [75]
- $34 + 96$  [130]
- $283 + 75$  [358]
- $159 + 512$  [671]
- $1,752 + 6,431$  [8,183]
- $3,461 + 2,674$  [6,135]

## Enrichment 57

Name \_\_\_\_\_ E57

**Multiplication Patterns**



LOOK FOR PATTERNS.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
C	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
D	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75
E	0	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100
F	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125
G	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150
H	0	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	175
I	0	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200
J	0	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180	189	198	207	216	225
K	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
L	0	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220	231	242	253	264	275
M	0	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300

- Which column is the same as row A? **N**
- Which row is the same as the numbers across the top? **B**
- Which column matches the numbers down the side? **O**
- Row C shows counting by what number? **by 2s**
- Column S shows counting by what number? **by 5s**
- Look at the tens digits in column W. Look at the ones digits. What pattern do you see?  
**The sum of the 2 digits is 9.**
- What is true about the sums of the digits for numbers 1-9 in row J?  
**All the sums are 9.**
- Use these patterns and others that you see to extend the chart without multiplying.

## Additional Resource 57

Name \_\_\_\_\_ Additional Resource 57

**Maintenance**

Add or subtract.

- $\$4.37 + \$9.19 =$   **$\$13.56$**
- $\$9.19 - \$4.37 =$   **$\$4.82$**
- $\$15.00 - \$4.25 =$   **$\$10.75$**
- $\$38.69 - \$9.54 =$   **$\$29.15$**
- $\$86.15 - \$25.78 =$   **$\$60.37$**
- $\$32.45 - \$24.00 =$   **$\$8.45$**
- $\$83.45 + \$9.88 =$   **$\$93.33$**
- $\$75.38 - \$9.39 =$   **$\$65.99$**
- $\$50.00 - \$34.78 =$   **$\$15.22$**
- $\$54.31 + \$10.76 =$   **$\$65.07$**
- $\$23.54 - \$1.99 =$   **$\$21.55$**
- $\$105.0 - \$9.93 =$   **$\$95.07$**

Use the table to help you solve each problem.

- What is the total cost of a pair of shoes and 2 pairs of socks?  
 **$\$24.93$**
- Carla bought a belt and paid with \$10.00. How much change did she receive?  
 **$\$2.01$**

Item	Cost
Shoes	\$19.95
Socks	\$2.49
Belt	\$7.99



## Objective 58

Multiply a three- or four-digit number and a one-digit number with more than one renaming.

### Lesson Theme

Recreation: San Diego Wild Animal Park

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Computation Squares (Teaching Aid D)

### Introduction

**Warm-Up Review** Have students complete these multiplication exercises.

$\begin{array}{r} 36 \\ \times 2 \\ \hline [72] \end{array}$	$\begin{array}{r} 19 \\ \times 5 \\ \hline [95] \end{array}$	$\begin{array}{r} 25 \\ \times 8 \\ \hline [200] \end{array}$	$\begin{array}{r} 127 \\ \times 3 \\ \hline [381] \end{array}$
--	--	---	--

### Using the Pages

**Teach** For Example A, point out that 185 has been rounded up. Remind students that this means that the actual answer will be less than 600. Be sure that students use hundred-squares, ten-sticks, and unit-squares to display  $3 \times 185$  as they work through each step of the multiplication.

For Example B, have students record their key sequences. Then have them explain the sequences to the class. Students should recognize that they can either add or multiply when they are joining equal groups to find a total. The number of groups in multiplication is equal to the number of addends in addition. So,  $4 \times 367$  is the same as  $367 + 367 + 367 + 367$ .

**Practice Estimation** Have students estimate the answers to Exercises 10–14 before they use their calculators. Point out that their estimates will help them tell if their answers are reasonable.

**Error Analysis** Ask students who are having difficulties to come to your desk. Write  $3 \times 145$  on the chalkboard. Display three groups of 145 using hundred-squares, ten-sticks, and unit-squares. Combine the counters and make the exchanges, explaining each step as you go along. Write on the board:

$$\begin{array}{r} 145 \\ \times 3 \\ \hline 15 \quad 3 \times 5 = 1 \text{ ten } 5 \text{ ones} \\ 120 \quad 3 \times 4 \text{ tens} = 1 \text{ hundred } 2 \text{ tens} \\ + 300 \quad 3 \times 1 \text{ hundred} = 3 \text{ hundreds} \\ \hline 435 \end{array}$$

Point out that 15 ones have been renamed as 1 ten 5 ones and 12 tens have been renamed as 1 hundred 2 tens.

(Continued on page 157.)

## Multiplication: More Than One Renaming

- A. If 185 visitors entered the San Diego Wild Animal Park each hour, how many visitors entered in 3 hours?

Find  $3 \times 185$ .

Estimate using rounding:  
 $3 \times 200 = 600$

Work in a group. Show each step in the computation with place-value materials.

Put 3 groups of 185 together. How many ones are there in all? This is how many tens and ones?  
**15; 1 ten and 5 ones**

Multiply the ones.

$$\begin{array}{r} 185 \\ \times 3 \\ \hline 5 \end{array}$$

$3 \times 5 = 15$   
 $15 = 1 \text{ ten } 5 \text{ ones}$

Now put the tens together. How many tens are there in all? This is how many hundreds and tens?  
**25; 2 hundreds and 5 tens**

Multiply the tens.

$$\begin{array}{r} 185 \\ \times 3 \\ \hline 55 \end{array}$$

$3 \times 8 \text{ tens} = 24 \text{ tens}$   
 $24 \text{ tens} + 1 \text{ ten} = 25 \text{ tens}$   
 $25 \text{ tens} = 2 \text{ hundreds } 5 \text{ tens}$

How many hundreds are there in all?  
**5 hundreds**

Multiply the hundreds.

$$\begin{array}{r} 185 \\ \times 3 \\ \hline 555 \end{array}$$

$3 \times 1 \text{ hundred} = 3 \text{ hundreds}$   
 $3 \text{ hundreds} + 2 \text{ hundreds} = 5 \text{ hundreds}$

555 visitors would enter in 3 hours.

Look at the estimate. Is 555 a reasonable answer? **Yes**

- B. **CALCULATOR** Press  $185 \times 3 =$  **Display: 555**

Compare this to the computation in Example A.

Write a generalization about the relationship between multiplication and addition.

**Multiplication is repeated addition.**

Test your generalization by finding  $367 \times 4$  both ways.

Press:  $367 \times 4 =$  **Display: 1468**

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Press:  $367 + 367 = + 367 = + 367 =$  **Display: 1468**



## Practice 58

Name \_\_\_\_\_ P58

Can you trace the figure without lifting your pencil from the paper, without crossing a line, and without going over any line twice?

To find the solution, work each exercise. Then trace through the dots in the same order as the answers are given.

1. $\begin{array}{r} 826 \\ \times 4 \\ \hline 3,304 \end{array}$	2. $\begin{array}{r} 247 \\ \times 3 \\ \hline 741 \end{array}$	3. $\begin{array}{r} 527 \\ \times 5 \\ \hline 2,635 \end{array}$	4. $\begin{array}{r} 158 \\ \times 6 \\ \hline 948 \end{array}$
5. $\begin{array}{r} 413 \\ \times 8 \\ \hline 3,304 \end{array}$	6. $\begin{array}{r} 1,087 \\ \times 4 \\ \hline 4,348 \end{array}$	7. $\begin{array}{r} 756 \\ \times 9 \\ \hline 6,804 \end{array}$	8. $\begin{array}{r} 3,078 \\ \times 7 \\ \hline 21,546 \end{array}$

9.  $296 \times 2 = 592$  10.  $2,268 \times 3 = 6,804$  11.  $3,518 \times 4 = 14,072$

12.  $4,138 \times 5 = 20,690$  13.  $1,134 \times 6 = 6,804$  14.  $1,652 \times 2 = 3,304$

## Reteaching 58

Name \_\_\_\_\_ R58

Find  $4 \times 185$

Multiply the ones:  
 $4 \times 5 = 20$

Multiply the tens:  
 $4 \times 8 \text{ tens} = 32 \text{ tens}$

Multiply the hundreds:  
 $4 \times 1 \text{ hundred} = 4 \text{ hundreds}$

hundreds tens ones  
 $\begin{array}{r} 185 \\ \times 4 \\ \hline 740 \end{array}$

Show 2 tens 0 ones  
 $4 \times 185 = 740$

Add 2 tens  
Show 4 tens 3 hundreds

Add 3 hundreds  
Show 7 hundreds

Multiplication is a product of our times!

Multiply:

1. $\begin{array}{r} 138 \\ \times 5 \\ \hline 690 \end{array}$	2. $\begin{array}{r} 638 \\ \times 2 \\ \hline 1276 \end{array}$
3. $\begin{array}{r} 237 \\ \times 3 \\ \hline 711 \end{array}$	4. $\begin{array}{r} 246 \\ \times 3 \\ \hline 738 \end{array}$
5. $\begin{array}{r} 173 \\ \times 8 \\ \hline 1384 \end{array}$	6. $\begin{array}{r} 231 \\ \times 8 \\ \hline 1848 \end{array}$
7. $\begin{array}{r} 208 \\ \times 4 \\ \hline 832 \end{array}$	8. $\begin{array}{r} 561 \\ \times 2 \\ \hline 1122 \end{array}$
9. $\begin{array}{r} 437 \\ \times 4 \\ \hline 1748 \end{array}$	10. $\begin{array}{r} 350 \\ \times 8 \\ \hline 2800 \end{array}$



## Assignment Guide

basic	1–27 odd or even
average	1–27 odd or even
enriched	1–9, 10–23 odd, 24–27

**More Practice Set 58,**  
page 372

(Continued from page 156.)

Then compare this to the computation below and ask students to explain the steps.

$$\begin{array}{r} 11 \\ 145 \\ \times 3 \\ \hline 435 \end{array}$$

**Apply Problem Solving** Have students tell which operation they would use to solve each problem. [Multiplication: 24, 26, 27. Addition: 25]

**Too much information** For Problem 27, ask students to give the information they do not need.

## Follow-Up

**Extra Practice** Have students make computation squares like those shown. Be sure that the single-digit numbers are placed diagonally to each other. Then have students exchange papers and do the computation.

$\times$	3	274	[822]
$\downarrow$	156	2	[312]
	[468]	[548]	

$\times$	532	6	[3,192]
$\downarrow$	4	198	[792]
	[2,128]	[1,188]	

**Reteaching** Here is another approach that some students may find easier. Have students fill in missing digits.

$$\begin{array}{r} 1. \quad 200 + 30 + 6 \\ \times \quad \quad \quad 4 \\ \hline [8][0][0] + 120 + 24 \\ \hline [1][2][0] \\ + 800 \\ \hline [9][4][4] \end{array}$$

$$\begin{array}{r} 2. \quad 100 + 60 + 3 \\ \times \quad \quad \quad 6 \\ \hline 600 + 360 + [1][8] \\ \hline [3][6][0] \\ + [6][0][0] \\ \hline [9][7][8] \end{array}$$

**Computer Assisted Instruction**  
Mathematics Courseware Series  
• Multiplication 2, Activity 6

## Daily Maintenance

Write the number that is 1,000 greater.

- 2,340 [3,340]
- 6,579 [7,579]
- 7,413 [8,413]
- 3,227 [4,227]
- 9,082 [10,082]
- 591 [1,591]

**Try** Multiply. Work in groups. Show the computation with your place-value materials.

$$\begin{array}{r} \text{a. } 143 \\ \times 4 \\ \hline 572 \end{array}$$

$$\begin{array}{r} \text{b. } 279 \\ \times 3 \\ \hline 837 \end{array}$$

$$\begin{array}{r} \text{c. } 2 \times 376 \\ \hline 752 \end{array}$$

- d. Look at the key sequence for the calculator in Example B. Write another key sequence which uses  $\boxed{+}$  and  $\boxed{=}$  that can be used to find  $3 \times 185$ .
- $185 \boxed{+} \boxed{+} \boxed{+} \boxed{=}$

**Practice** Multiply.

$$\begin{array}{r} 1. \quad 236 \\ \times 4 \\ \hline 944 \end{array}$$

$$\begin{array}{r} 2. \quad 123 \\ \times 8 \\ \hline 984 \end{array}$$

$$\begin{array}{r} 3. \quad 216 \\ \times 7 \\ \hline 1,512 \end{array}$$

$$\begin{array}{r} 4. \quad 177 \\ \times 5 \\ \hline 885 \end{array}$$

$$\begin{array}{r} 5. \quad 238 \\ \times 3 \\ \hline 714 \end{array}$$

$$\begin{array}{r} 6. \quad 229 \\ \times 4 \\ \hline 916 \end{array}$$

$$\begin{array}{r} 7. \quad 134 \\ \times 6 \\ \hline 804 \end{array}$$

$$\begin{array}{r} 8. \quad 974 \\ \times 3 \\ \hline 2,922 \end{array}$$

$$\begin{array}{r} 9. \quad 127 \\ \times 5 \\ \hline 635 \end{array}$$

**Calculator** Use a calculator to find each product.

$$\begin{array}{r} 10. \quad 4,127 \\ \times 6 \\ \hline 24,762 \end{array}$$

$$\begin{array}{r} 11. \quad 4,671 \\ \times 2 \\ \hline 9,342 \end{array}$$

$$\begin{array}{r} 12. \quad 2,516 \\ \times 9 \\ \hline 22,644 \end{array}$$

$$\begin{array}{r} 13. \quad 3 \times 8,159 \\ \hline 24,477 \end{array}$$

$$\begin{array}{r} 14. \quad 1,517 \times 5 \\ \hline 7,585 \end{array}$$

**Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math  
Choose a method to find each answer. Tell which method you used.

$$\begin{array}{r} 15. \quad 1,670 \\ \times 4 \\ \hline 6,680; P, C \end{array}$$

$$\begin{array}{r} 16. \quad 1,925 \\ \times 3 \\ \hline 5,775; P, C \end{array}$$

$$\begin{array}{r} 17. \quad 1,516 \\ \times 5 \\ \hline 7,580; P, C \end{array}$$

$$\begin{array}{r} 18. \quad 1,139 \\ \times 6 \\ \hline 6,834; P, C \end{array}$$

$$\begin{array}{r} 19. \quad 5,187 \\ \times 4 \\ \hline 20,748; P, C \end{array}$$

$$\begin{array}{r} 20. \quad 8 \times 114 \\ \hline 912; P \end{array}$$

$$\begin{array}{r} 21. \quad 2 \times 398 \\ \hline 796; M, P \end{array}$$

$$\begin{array}{r} 22. \quad 2,187 \times 4 \\ \hline 8,748; P, C \end{array}$$

$$\begin{array}{r} 23. \quad 6,274 \times 3 \\ \hline 18,822; P, C \end{array}$$

**Apply** Solve each problem.

24. Each monorail train at the Wild Animal Park carries 125 people. How many people can 6 of these trains carry?

**750 people**

26. **Mental math** A baby elephant gains about 2 pounds a day. How much will the baby elephant gain in 30 days?

**60 pounds**

25. The plan for the Wild Animal Park was started in 1959. The park opened 13 years later. In what year did the park open?

**1972**

27. By the end of 1978, 36 cheetahs were born at the park. A cheetah can run 26 meters per second. How many meters can a cheetah run in 9 seconds?

**234 meters**

More Practice Set 58, page 372 **157**

## Enrichment 58

Name \_\_\_\_\_ E58

**Multiplying by Adding**

Find  $312 \times 9$ .

Try this method for finding products.

Step 1—Write the original problem with the smaller factor first.

Step 2—Divide the first factor by 2 and drop any remainder. Multiply the second factor by 2.

Step 3—Repeat step 2 until the first factor is 1.

Step 4—Add all the second factors where the first factor is odd.

This sum is the answer.

So,  $9 \times 312 = 2,808$ .

Use this method to find the following products.

- $6 \times 503 = 3,018$
- $941 \times 8 = 7,528$
- $1,035 \times 7 = 7,245$
- $8 \times 1,286 = 10,288$
- $3,222 \times 5 = 16,110$
- $4 \times 925 = 3,700$

## Additional Resource 58

Name \_\_\_\_\_ Additional Resource 58

**Calculator Border Products**

Use me to compute the answers to this multiplication and addition exercise.

1. Count how many numbers are in the first border frame around 24. Multiply this number by 24.

$8 \square 24 \square 192$

2. Now add the 8 numbers.

$16 \square 17 \square 18 \square 25 \square 32 \square 31 \square 30 \square 23 \square 192$

3. How do your answers to Exercises 1 and 2 compare?

**They are the same.**

4. Count how many numbers are in the border frame that contains 8. Multiply this number by 24.

$16 \square 24 \square 384$

5. Find the sum of these numbers.

$384$

6. How do your answers to Exercises 4 and 5 compare?

**They are the same.**

7. Without adding, predict the sum of the numbers in the border frame that contains 0.

$576$

8. Check your prediction by adding all the numbers in this border frame.

$576$



**Objective 59** (Target Objective)  
Multiply a three- or four-digit number containing zeros by a one-digit number.

**Lesson Theme**  
Recreation: Travel

**Materials**  
• Hundreds, Tens, Units (Punchouts or Math Kit)

## Introduction

**Motivational Situation** Pose the following situation to students. Suppose you can take a trip to any city you want. Name the city. What kinds of transportation could you take to get there? [Plane, boat, train, bus, car] Name places in the city that you would like to visit. [Historical landmarks, amusement park, zoo, and so on]

## Using the Pages

**Teach** For Example A, tell students to work through the problem using place-value materials as they have in previous lessons. Stress that the multiplication and renaming are performed exactly as before, even though there is a zero in the greater factor.

After students have worked through Example B, you might want to have them work through and explain the steps for finding  $3 \times 4,007$ .

**Try Error Analysis** Watch for students who multiply only the non-zero digits. Have students who make this error write their work in place-value charts as shown in **Reteaching 59**.

**Practice Estimation** Have students estimate the answers to Exercises 1, 2, 7, and 8. Help students see that their estimates are very close to the actual product when there is a zero in the tens place of a three-digit number. Use Exercises 10, 12, 13, and 14 to demonstrate that a comparable situation exists when there is a zero in the hundreds place.

**Apply Problem Solving** Remind students to give a label with their numerical answer.

**Try and check** Students use their calculators for Problem 19. If students have difficulty getting started, suggest that they multiply  $100 \times 100$  and  $200 \times 200$ . Point out that 34,969 falls between the two products. Suggest that students narrow down the possibilities further by multiplying  $150 \times 150$ ,  $160 \times 160$ , and so on. You might ask students if the number can be even. [No, because 34,969 is not even]

## Multiplication: Renaming with Zeros

Mr. and Mrs. Rivera traveled by plane to San Diego. Their tickets cost \$206 each. How much did the Riveras pay for 2 tickets?

Find  $2 \times 206$ .

Estimate using rounding:  
 $2 \times 200 = 400$

- A.** Work in groups of 4. Use your place-value materials. Explain to someone in your group how to find  $2 \times 206$ . What is the answer?  
**412**

- B.** Now study the computation. Answer the questions with other students in your group.

Multiply the ones.

$$\begin{array}{r} 1 \\ 206 \\ \times 2 \\ \hline \end{array}$$

$2 \times 6 = 12$   
How many tens and ones is this?  
**1 ten and 2 ones**

Multiply the tens.

$$\begin{array}{r} 1 \\ 206 \\ \times 2 \\ \hline 12 \end{array}$$

$2 \times 0$  tens = 0 tens  
How many tens are there in all? Why?  
**1 ten; 1 ten left from multiplying the ones.**

Multiply the hundreds.

$$\begin{array}{r} 1 \\ 206 \\ \times 2 \\ \hline 412 \end{array}$$

$2 \times 2$  hundreds = 4 hundreds  
How many hundreds are there in all? **4**

The Riveras paid \$412 for their plane tickets. Is this answer reasonable? How do you know?

**Yes; it is close to the estimated answer. 158**

**Try** Work in groups. Show the computation with your place-value materials.

**a.**  $179 \times 4$   
**716**

**b.**  $209 \times 3$   
**627**

**c.**  $2 \times 390$   
**780**  
**d.**  $105 \times 4$   
**420**

**Practice** Multiply.

**1.**  $301 \times 6$   
**1,806**

**2.**  $402 \times 7$   
**2,814**

**3.**  $520 \times 9$   
**4,680**

**4.**  $860 \times 3$   
**2,580**

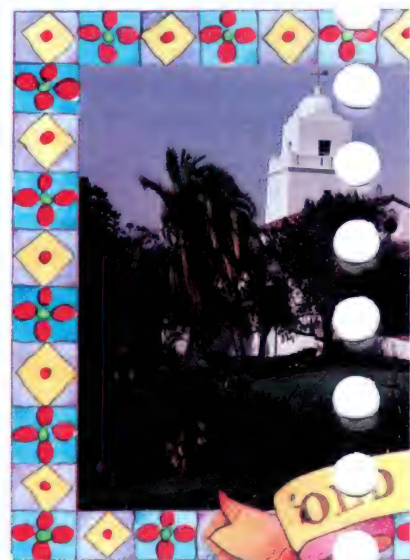
**5.**  $400 \times 6$   
**2,400**

**6.**  $560 \times 5$   
**2,800**

**7.**  $601 \times 8$   
**4,808**

**8.**  $302 \times 5$   
**1,510**

**9.**  $750 \times 8$   
**6,000**



## Practice 59

Name: \_\_\_\_\_ P59

Multiply.

1. $305 \times 3$ <b>915</b>	2. $106 \times 7$ <b>742</b>	3. $450 \times 4$ <b>1,800</b>	4. $380 \times 2$ <b>760</b>
5. $705 \times 5$ <b>3,525</b>	6. $340 \times 6$ <b>2,040</b>	7. $280 \times 3$ <b>840</b>	8. $307 \times 4$ <b>1,228</b>
9. $204 \times 8$ <b>1,632</b>	10. $300 \times 9$ <b>2,700</b>	11. $560 \times 6$ <b>3,360</b>	12. $700 \times 7$ <b>4,900</b>
13. $2024 \times 3$ <b>6,072</b>	14. $4802 \times 2$ <b>9,604</b>	15. $1310 \times 6$ <b>7,860</b>	16. $2401 \times 4$ <b>9,604</b>

Multiply to complete the diagram.

## Reteaching 59

Name: \_\_\_\_\_ R59

Find  $4 \times 607$ .

Multiply the ones:  $4 \times 7 = 28$

Multiply the tens:  $4 \times 0 = 0$  tens

Multiply the hundreds:  $4 \times 6$  hundreds = 24 hundreds

What has no hands but can open doors?

Multiply. Then connect your answers in order.

1. $208 \times 4$ <b>832</b>	2. $409 \times 3$ <b>1227</b>	3. $305 \times 7$ <b>2135</b>	4. $140 \times 6$ <b>840</b>
5. $530 \times 5$ <b>2650</b>	6. $620 \times 8$ <b>4960</b>	7. $309 \times 2$ <b>618</b>	8. $170 \times 4$ <b>680</b>
9. $290 \times 6$ <b>1740</b>	10. $900 \times 8$ <b>7200</b>	11. $507 \times 9$ <b>4563</b>	

START 832



10. $\begin{array}{r} 6,027 \\ \times 5 \\ \hline 30,135 \end{array}$	11. $\begin{array}{r} 3,410 \\ \times 4 \\ \hline 13,640 \end{array}$	12. $\begin{array}{r} 2,002 \\ \times 5 \\ \hline 10,010 \end{array}$	13. $\begin{array}{r} 7,050 \\ \times 6 \\ \hline 42,300 \end{array}$	14. $\begin{array}{r} 8,007 \\ \times 8 \\ \hline 64,056 \end{array}$
---	---	---	---	---

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.

15. In a jewelry shop in San Diego, Mrs. Rivera saw gold bracelets that sold for \$205 each. Could she buy 3 of the bracelets for \$600?  
**No; M**
17. Some of the houses that still stand today in San Diego's Old Town were built in 1829. How old were these houses in 1980?  
**151 years old; P, C**
19. What number multiplied by itself gives the product 34,969?  
**187; C**
16. The San Diego Trolley has a 32-mile round trip to the Mexican border. How far does the trolley travel in 6 round trips to the border?  
**192 miles; P**
18. At Sea World, a trained whale performs in a 3,000-seat stadium. How many people in all can be seated to see 4 shows?  
**12,000 people; M**



## MAINTENANCE

Multiply.

- |                               |                               |
|-------------------------------|-------------------------------|
| 1. $7 \times 2$<br><b>14</b>  | 2. $3 \times 6$<br><b>18</b>  |
| 3. $9 \times 3$<br><b>27</b>  | 4. $1 \times 5$<br><b>5</b>   |
| 5. $7 \times 6$<br><b>42</b>  | 6. $3 \times 4$<br><b>12</b>  |
| 7. $5 \times 5$<br><b>25</b>  | 8. $8 \times 6$<br><b>48</b>  |
| 9. $4 \times 0$<br><b>0</b>   | 10. $3 \times 8$<br><b>24</b> |
| 11. $4 \times 7$<br><b>28</b> | 12. $5 \times 4$<br><b>20</b> |
| 13. $8 \times 8$<br><b>64</b> | 14. $2 \times 4$<br><b>8</b>  |
| 15. $6 \times 9$<br><b>54</b> | 16. $8 \times 2$<br><b>16</b> |
| 17. $6 \times 6$<br><b>36</b> | 18. $9 \times 5$<br><b>45</b> |

More Practice Set 59, page 372 **159**

## Assignment Guide

basic	1-14 odd, 15-18
average	1-14 even, 15-19
enriched	1-19

**More Practice Set 59, page 372**

## Follow-Up

**Extra Practice** Play the following game. Mark a set of ten cards with the digits 0 through 9. Divide the class into two teams. The first person from each team should be at the board as you pull three or more cards. This first set of numbers represents the first factor of a multiplication exercise. Now pull one more card (not zero) to be the second factor. If you had drawn "3,506" and "7," the students should have written:

$$\begin{array}{r} 3,506 \\ \times 7 \\ \hline \end{array}$$

The first student to correctly complete the exercise scores a point for the team.

**Reteaching** Have students solve exercises not previously assigned or solved incorrectly by rewriting the exercises first using expanded form.

1. $\begin{array}{r} 500 + 3 \\ \times 6 \\ \hline [3,000 + 18] \end{array}$	$\begin{array}{r} 503 \\ \times 6 \\ \hline [3,018] \end{array}$
2. $\begin{array}{r} 2000 + 30 \\ \times 4 \\ \hline [8,000 + 120] \end{array}$	$\begin{array}{r} 2,030 \\ \times 4 \\ \hline [8,120] \end{array}$

## Calculator

Have students multiply 108 by the numbers from 1 to 10 using calculators. Have them notice the pattern in the products. Then suggest they multiply 206 by 8 mentally.

**Computer Assisted Instruction**  
Mathematics Courseware Series  
• Multiplication 2, Activity 7

## Enrichment 59

Name: \_\_\_\_\_ E59

**Cross-Number Puzzle IV**

Multiply to complete the cross-number puzzle below.

<b>Across</b>	<b>Down</b>
1. $4 \times 70,006$	1. $670 \times 4$
5. $7 \times 5,067$	2. $22,461 \times 4$
6. $5 \times 5,077$	3. $7 \times 32,103$
8. $6 \times 148,207$	4. $6 \times 754$
9. $2 \times 43,902$	5. $9 \times 42,060$
11. $8,256 \times 9$	7. $8 \times 73,090$
13. $3 \times 1,584$	10. $2,179 \times 4$
14. $5 \times 902$	12. $8 \times 459$
15. $9,856 \times 2$	

## Additional Resource 59

Name: \_\_\_\_\_ Additional Resource 59

**Calculator Products and Factors Game**

I make multiplication easy. Use me to play this products and factors game.

Select two numbers, one from each group

13 35 63 49      4 6 8 9

Multiply them on your calculator. If the product is in one of the grid boxes below, write the two factors in that grid box. Joe chose 13 and 6. He wrote "13 x 6" in the box for 78.

Play this game with a friend. Take turns and use two different colors to write your factors in the grid boxes. The first player to get four in a row, column, or diagonal wins.

504	78	315	196
63 x 8		35 x 9	49 x 4
210	252	441	104
35 x 6	63 x 4	49 x 9	13 x 8
378	140	52	294
63 x 6	35 x 4	13 x 4	49 x 6
117	392	567	280
13 x 9	49 x 8	63 x 9	35 x 8

## Daily Maintenance

First multiply and then add.

1.  $5 \times 4 + 3$  [23]
2.  $9 \times 6 + 8$  [62]
3.  $4 \times 9 + 1$  [37]
4.  $6 \times 3 + 4$  [22]
5.  $4 \times 8 + 2$  [34]
6.  $7 \times 2 + 5$  [19]
7.  $9 \times 4 + 7$  [43]
8.  $8 \times 6 + 5$  [53]



## Practice

Mixed Practice for Objectives 55–59

## Introduction

### Warm-Up Review

$7 \times 8 + 6$ [62]	$9 \times 9 + 2$ [83]
$6 \times 9 + 3$ [57]	$6 \times 7 + 5$ [47]
$5 \times 7 + 4$ [39]	$3 \times 9 + 2$ [29]
$4 \times 5 + 3$ [23]	$4 \times 8 + 1$ [33]
$8 \times 6 + 5$ [53]	$5 \times 6 + 5$ [35]

## Using the Pages

**Practice** Encourage students to look for a pattern and to guess what the last two products in each row will be after doing two or three exercises. Then have them check their guess by finding the actual products.

**Apply Problem Solving** Explain what a double-decker bus is, if necessary.

**Additional problem** There are 100 people waiting for a bus. Which bus or combination of buses would be needed to hold 100 passengers? [1 double-decker bus, 1 regular bus and 3 minibuses, 2 regular buses, 8 minibuses]

**Teaching tips** Encourage students to ask questions which might help them to understand the problem. Some questions which might be asked if not suggested by students are:

1. Could the bus(es) hold more than 100 passengers? [Yes]
2. Would 5 minibuses be a correct answer if 4 minibuses would hold 100 passengers? [No]

Encourage students to give partial answers such as 1 regular bus and some minibuses.

**Try and check** Encourage students to guess a combination of buses and to check to determine if it is a correct solution. To help students begin this strategy, you may wish to ask questions such as: Would 1 regular bus and 2 minibuses hold 100 passengers? [No] 6 minibuses? [No] Encourage students to use wrong answers to help them find correct solutions.

**Choosing a computation method** Read these problems to students and have them choose whether to estimate or to compute an exact answer.

1. A visitor to Chicago noticed that in 1 minute 6 buses drove by the corner where she was standing. At this rate, how many buses would pass that corner in 10 minutes? [60 buses]
2. A city has 156 bus routes with 8 buses in service on each route. It also has 150 buses to replace those that need servicing or repair. Would 1,500 buses meet the need for bus service? [Yes]

## Practice: Multiplication

After students have worked the exercises, discuss the patterns with them.

Multiply.

Find the pattern of answers in each row. Various patterns may be found. Samples are given.

Row A In each answer, the digits are in consecutive order.

1. $\begin{array}{r} 41 \\ \times 3 \\ \hline 123 \end{array}$	2. $\begin{array}{r} 26 \\ \times 9 \\ \hline 234 \end{array}$	3. $\begin{array}{r} 115 \\ \times 3 \\ \hline 345 \end{array}$	4. $\begin{array}{r} 76 \\ \times 6 \\ \hline 456 \end{array}$	5. $\begin{array}{r} 63 \\ \times 9 \\ \hline 567 \end{array}$
--	--	---	--	--

Row B Each answer is 504.

6. $\begin{array}{r} 56 \\ \times 9 \\ \hline 504 \end{array}$	7. $\begin{array}{r} 63 \\ \times 8 \\ \hline 504 \end{array}$	8. $\begin{array}{r} 72 \\ \times 7 \\ \hline 504 \end{array}$	9. $\begin{array}{r} 84 \\ \times 6 \\ \hline 504 \end{array}$	10. $\begin{array}{r} 126 \\ \times 4 \\ \hline 504 \end{array}$
--	--	--	--	--

Row C In each answer, the sum of the digits is 9.

11. $\begin{array}{r} 23 \\ \times 9 \\ \hline 207 \end{array}$	12. $\begin{array}{r} 34 \\ \times 9 \\ \hline 306 \end{array}$	13. $\begin{array}{r} 45 \\ \times 9 \\ \hline 405 \end{array}$	14. $\begin{array}{r} 56 \\ \times 9 \\ \hline 504 \end{array}$	15. $\begin{array}{r} 67 \\ \times 9 \\ \hline 603 \end{array}$
---	---	---	---	---

Row D The digits are consecutive odd or consecutive even numbers.

16. $\begin{array}{r} 27 \\ \times 5 \\ \hline 135 \end{array}$	17. $\begin{array}{r} 123 \\ \times 2 \\ \hline 246 \end{array}$	18. $\begin{array}{r} 51 \\ \times 7 \\ \hline 357 \end{array}$	19. $\begin{array}{r} 78 \\ \times 6 \\ \hline 468 \end{array}$	20. $\begin{array}{r} 193 \\ \times 3 \\ \hline 579 \end{array}$
---	--	---	---	--

Row E Each answer is a palindrome (reads same left to right as right to left).

21. $\begin{array}{r} 131 \\ \times 2 \\ \hline 262 \end{array}$	22. $\begin{array}{r} 121 \\ \times 3 \\ \hline 363 \end{array}$	23. $\begin{array}{r} 116 \\ \times 4 \\ \hline 464 \end{array}$	24. $\begin{array}{r} 113 \\ \times 5 \\ \hline 565 \end{array}$	25. $\begin{array}{r} 111 \\ \times 6 \\ \hline 666 \end{array}$
--	--	--	--	--

Row F Each answer is 10 more than the preceding one.

26. $\begin{array}{r} 101 \\ \times 5 \\ \hline 505 \end{array}$	27. $\begin{array}{r} 103 \\ \times 5 \\ \hline 515 \end{array}$	28. $\begin{array}{r} 105 \\ \times 5 \\ \hline 525 \end{array}$	29. $\begin{array}{r} 107 \\ \times 5 \\ \hline 535 \end{array}$	30. $\begin{array}{r} 109 \\ \times 5 \\ \hline 545 \end{array}$
--	--	--	--	--

Row G In each answer, the digits are in numerical order.

31. $\begin{array}{r} 617 \\ \times 2 \\ \hline 1,234 \end{array}$	32. $\begin{array}{r} 2,263 \\ \times 3 \\ \hline 6,789 \end{array}$	33. $\begin{array}{r} 469 \\ \times 5 \\ \hline 2,345 \end{array}$	34. $\begin{array}{r} 384 \\ \times 9 \\ \hline 3,456 \end{array}$	35. $\begin{array}{r} 2,839 \\ \times 2 \\ \hline 5,678 \end{array}$
--	--	--	--	--

**Mental math** Multiply mentally. Write only the product.

36. $6 \times 40$ 240	37. $7 \times 200$ 1,400	38. $5 \times 3,000$ 15,000	39. $12 \times 10$ 120
40. $8 \times 50$ 400	41. $9 \times 900$ 8,100	42. $25 \times 1,000$ 25,000	43. $5 \times 400$ 2,000
44. $59 \times 100$ 5,900	45. $35 \times 10$ 350	46. $7 \times 800$ 5,600	47. $3 \times 9,000$ 27,000
48. $6 \times 4 \times 5$ 120	49. $7 \times 2 \times 5$ 70	50. $5 \times 9 \times 8$ 360	51. $5 \times 5 \times 4$ 100



## Practice Game

### Multi-Squares

Number of players: 2–4

**Materials:** Worksheet with grids as shown (number of grids per worksheet can vary), 10 cards with digits 0–9, calculator

### Rules

1. Choose one player to be the leader in each round.
2. The leader turns the cards face down, picks one card from the pile, and shows it to all players.

$\begin{array}{ c c c c } \hline 7 & 4 & 2 & 0 \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline 8 & & & 3 \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$
$\times$	$\times$	$\times$
6 6, 7 8 0		

$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$
$\times$	$\times$	$\times$

$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline & & & \\ \hline \end{array}$
$+$	$-$	$\times$

$\square \overline{) \square \square \square \square}$	$\square \square \overline{) \square \square \square \square}$
--	--



## Assignment Guide

basic	1-25, 36-47, 52-55, 57
average	1-35, 36-51 even, 52-55, 57
enriched	1-15, 36-51 odd, 52-57

## Follow-Up

Have students play the game that is described below the lesson pages. This game may be played with easier or more difficult multiplication exercises. By making appropriate grids, this game may also be played with addition, subtraction, and division exercises.

To use the game with subtraction, all cards needed must be displayed at one time. The players are then given 3 seconds to place the digits in the boxes.

To use the game with the division, do not use a card marked with zero.

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic, and then give reasons for their choices.

- $4,000 \times 10$  [40,000]
- $641 \times 2$  [1,282]
- $19 \times 4$  [76]
- $700 \times 8$  [5,600]
- $942 \times 7$  [6,594]
- $826 \times 3$  [2,478]
- $3,261 \times 5$  [16,305]
- $9,178 \times 6$  [55,068]

## Computer Assisted Instruction

Mathematics Courseware Series

- Multiplication 2, Activity 8
- Strategies in Problem Solving
- Dinosaurs and Squids

## Daily Maintenance

Compare the numbers and write  $<$  or  $>$  in each circle.

- $32 \bigcirc 25$  [ $>$ ]
- $74 \bigcirc 86$  [ $<$ ]
- $187 \bigcirc 190$  [ $<$ ]
- $652 \bigcirc 673$  [ $<$ ]
- $8,568 \bigcirc 8,540$  [ $>$ ]
- $4,289 \bigcirc 4,375$  [ $<$ ]
- $6,832 \bigcirc 6,745$  [ $>$ ]



Regular Bus

Double-Decker Bus

Minibus

**Apply** *Use data from a picture.* Solve each problem.

- Cityville has 8 regular buses. How many passengers can ride on all 8 buses at one time?  
**544 passengers**
- There are 6 minibuses in Cityville. How many passengers can ride on the 6 minibuses at one time?  
**84 passengers**
- There are 39 passengers on the top deck of a double-decker bus and 47 passengers on the bottom deck. How many more passengers can the bus hold?  
**19 more passengers**
- How many more passengers can ride on a double-decker bus than on a regular bus?  
**37 more passengers**
- Cityville has 3 double-decker buses. How many passengers can ride on the 3 double-decker buses at one time?  
**315 passengers**
- Calculator** Greenville has 24 regular buses, 12 minibuses, and no double-decker buses. How many passengers can ride on all these buses at one time?  
**1,800 passengers**

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3. Each player writes that digit in any box of the first grid. (The object of the game is to place in the grid each number the leader picks in such a way that the multiplication exercise has the greatest product possible.)

4. The leader shows one card at a time and players write the digits in any box until the grid is filled.

5. Each player then does his or her multiplication exercise and checks the answer with a calculator. The player with the greatest product wins the round. Only correct answers will be used for scoring.

6. Another leader is chosen for the next round, and the game continues until all the grids on the worksheet are filled.

**Scoring:** The player with the greatest product for each round gets one point.

**The Winner:** The player with the most points at the end of the game is the winner.

### Variations

Players also could work for the least product. See Follow-up section for further variations.



## Objective 60

Multiply numbers that are multiples of 10, 100, or 1,000.

### Lesson Theme

Consumer Topics: Food Stand

### Materials

- Centimeter Grid (Teaching Aid K)

## Introduction

**Warm-Up Review** Review multiplying by tens, hundreds, and thousands. Have students explain how to find products mentally for the following exercises.

$8 \times 10$  [80],  $8 \times 100$  [800],  
 $8 \times 1,000$  [8,000];  $9 \times 30$  [270],  
 $9 \times 300$  [2,700],  $9 \times 3,000$  [27,000];  
 $6 \times 50$  [300],  $6 \times 500$  [3,000],  
 $6 \times 5,000$  [30,000];  $46 \times 10$  [460],  
 $46 \times 100$  [4,600],  $46 \times 1,000$  [46,000]

**Using Concrete Materials** Cut centimeter grid paper into strips of 10 squares and 10 by 10 hundred-squares. Give each of 20 students 4 strips. Ask how many squares there are in all. [800] Write this sentence on the board:  $20 \times 40 = 800$ . Then give each of 20 students 4 hundred-squares. Ask how many small squares there are in all. [8,000] Below the first equation write  $20 \times 400 = 8,000$ . Ask students to look for a pattern and complete the sentence  $20 \times 4,000 =$  [80,000].

## Using the Pages

**Teach** In Example A, use hundred-squares to demonstrate, if necessary. Begin with 10 groups of 200 and ask how many small squares there are. [2,000] Write on the board  $10 \times 200 = 2,000$ . Ask how many small squares there would be in 20 groups of 200 [4,000], in 60 groups of 200 [12,000]. Write on the board  $20 \times 200 = 4,000$  and  $60 \times 200 = 12,000$ . Then discuss Examples B and C. Ask students to look for patterns. [The number of zeros after the product of the nonzero digits is the same as the number of zeros in both factors.]

**Try Error Analysis** In Exercise e watch for students who omit a zero in the product. Have students making this error solve these exercises:  $2 \times 5$  [10],  $2 \times 50$  [100],  $20 \times 50$  [1,000],  $200 \times 50$  [10,000]. (See Reteaching 60.)

**Practice Mental Math** Encourage students to do the exercises mentally.

**Estimation** Encourage students to examine their answers to determine if they are reasonable.

**Apply Problem Solving** Both problems involve multiplication.

## Multiplying Multiples of 10: Mental Math

- A. Ron Morris owns a food stand in the park. He ordered 60 boxes of plastic spoons with 200 spoons in each box. How many plastic spoons did he order?

Find  $60 \times 200$ .

$$60 \times 200 = 12,000 \quad (6 \times 2 = 12)$$

Ron Morris ordered 12,000 plastic spoons.



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## Practice 60

Name \_\_\_\_\_ P60

Multiply

1. $6 \times 80 =$ <b>480</b>	2. $600 \times 80 =$ <b>48,000</b>
3. $5 \times 70 =$ <b>350</b>	4. $500 \times 70 =$ <b>35,000</b>
5. $8 \times 50 =$ <b>400</b>	6. $800 \times 50 =$ <b>40,000</b>
7. $9 \times 20 =$ <b>180</b>	8. $900 \times 20 =$ <b>18,000</b>
9. $30 \times 40 =$ <b>1,200</b>	10. $80 \times 20 =$ <b>1,600</b>
11. $60 \times 60 =$ <b>3,600</b>	12. $10 \times 80 =$ <b>800</b>
13. $200 \times 30 =$ <b>6,000</b>	14. $700 \times 80 =$ <b>56,000</b>
15. $600 \times 50 =$ <b>30,000</b>	16. $80 \times 400 =$ <b>32,000</b>
17. $50 \times 20 =$ <b>1,000</b>	18. $30 \times 700 =$ <b>21,000</b>
19. $60 \times 70 =$ <b>4,200</b>	20. $60 \times 80 =$ <b>4,800</b>
21. $50 \times 40 =$ <b>2,000</b>	22. $50 \times 70 =$ <b>3,500</b>
23. $300 \times 90 =$ <b>27,000</b>	24. $80 \times 50 =$ <b>4,000</b>
25. $100 \times 90 =$ <b>9,000</b>	26. $90 \times 20 =$ <b>1,800</b>

Solve each problem.

27. There are 500 sheets of paper in each package. How many sheets of paper are in 40 packages? **20,000 sheets**

28. There are 50 paper clips in a box. How many paper clips are in 800 boxes? **40,000 paper clips**

## Reteaching 60

Name \_\_\_\_\_ R60

Find the pattern.

A.  $4 \times 9 = 36$  no zero  
 $4 \times 90 = 360$  1 zero  
 $4 \times 900 = 3,600$  2 zeros  
 $40 \times 900 = 36,000$  3 zeros

B.  $5 \times 6 = 30$  no zero  
 $5 \times 60 = 300$  1 zero  
 $5 \times 600 = 3,000$  2 zeros  
 $50 \times 600 = 30,000$  3 zeros

When does a car look like a frog?

Multiply. Match each letter to its answer in the blanks below. One answer is used twice.

1. $7 \times 4 =$ <b>28</b> H	2. $7 \times 40 =$ <b>280</b> S	3. $70 \times 40 =$ <b>2,800</b> E
4. $3 \times 80 =$ <b>240</b> I	5. $3 \times 800 =$ <b>2,400</b> N	6. $3 \times 8,000 =$ <b>24,000</b> W
7. $4 \times 5 =$ <b>20</b> B	8. $4 \times 50 =$ <b>200</b> O	9. $4 \times 500 =$ <b>2,000</b> N
10. $50 \times 9 =$ <b>450</b> E	11. $50 \times 90 =$ <b>4,500</b> A	12. $500 \times 90 =$ <b>45,000</b> I
13. $7 \times 70 =$ <b>490</b> G	14. $60 \times 20 =$ <b>1,200</b> T	15. $30 \times 200 =$ <b>6,000</b> D

W H E N I T S  
 24,000 28 450 2,000 240 1,200 280

B E I N G T O A D  
 20 2,800 45,000 2,400 490 1,200 200 4,500 6,000



Study these patterns.

b.  $1 \times 80 = 80$   
 $10 \times 80 = 800$   
 $100 \times 80 = 8,000$   
 $1,000 \times 80 = 80,000$

c.  $40 \times 5 = 200$   
 $40 \times 50 = 2,000$   
 $40 \times 500 = 20,000$   
 $40 \times 5,000 = 200,000$



Compute mentally.  
Use your mind  
to save you time.

When you multiply numbers that end in zero, first multiply the digits that are not zero. Then write as many zeros in the product as there are in the factors.

Try Multiply.

a.  $20 \times 4 = 80$       b.  $8 \times 7,000 = 56,000$       c.  $40 \times 30 = 1,200$       d.  $20 \times 400 = 8,000$       e.  $200 \times 50 = 10,000$

Practice Multiply.

1.  $3 \times 60 = 180$       2.  $30 \times 60 = 1,800$       3.  $300 \times 60 = 18,000$       4.  $3,000 \times 60 = 180,000$       5.  $30 \times 6 = 180$   
6.  $8 \times 50 = 400$       7.  $80 \times 50 = 4,000$       8.  $800 \times 50 = 40,000$       9.  $8,000 \times 50 = 400,000$       10.  $5 \times 800 = 4,000$   
11.  $7 \times 80 = 560$       12.  $40 \times 80 = 3,200$       13.  $200 \times 80 = 12,000$       14.  $800 \times 3 = 2,400$       15.  $60 \times 70 = 4,200$   
16.  $90 \times 5 = 450$       17.  $10 \times 60 = 600$       18.  $7 \times 400 = 2,800$       19.  $30 \times 9,000 = 270,000$       20.  $200 \times 5 = 1,000$   
21.  $60 \times 4 = 240$       22.  $90 \times 90 = 8,100$       23.  $60 \times 800 = 48,000$       24.  $50 \times 600 = 30,000$       25.  $80 \times 700 = 56,000$

Apply Solve each problem.

26. Mr. Morris ordered 30 packages of paper cups with 40 cups in each package. How many cups did he order?  
**1,200 cups**

27. There are 500 straws in each box. How many straws are in 20 boxes?  
**10,000 straws**



More Practice Set 60, page 373 163

## Assignment Guide

basic 1–15, 16–27 even or odd  
average 1–27  
enriched 1–27

More Practice Set 60,  
page 373

## Follow-Up

**Extra Practice** Have students play the following game. For each group of 2–4 students, mark one set of white cards with multiples of 10 from 10 to 90 and a second set of colored cards with multiples of 100 from 100 to 900 and multiples of 1,000 from 1,000 to 9,000. Mix each set of cards separately and place them face down. To begin play, each person draws 2 cards from each set. Each person selects the two cards from his or her hand that will form the greatest product and places them face up on the table. The player who has the greatest product scores one point. Each player then draws another card from each set and play continues until all cards have been used. Player with the most points is the winner.

**Reteaching** Have students do the following sequences of exercises:

1.  $4 \times 6$  [24]      2.  $3 \times 7$  [21]  
 $40 \times 6$  [240]       $3 \times 70$  [210]  
 $40 \times 60$  [2,400]       $3 \times 700$  [2,100]  
 $40 \times 600$  [24,000]       $30 \times 700$  [21,000]  
3.  $8 \times 2$  [16]      4.  $5 \times 4$  [20]  
 $80 \times 2$  [160]       $5 \times 40$  [200]  
 $80 \times 20$  [1,600]       $50 \times 40$  [2,000]  
 $800 \times 20$  [16,000]       $50 \times 400$  [20,000]  
 $[16,000]$        $[20,000]$

**Enrichment** Have students put zeros in equations like the following to make them correct. Encourage students to find as many solutions as possible.

1.  $9 \times 3 = 27,000$  [ $9 \times 3,000$ ,  $90 \times 300$ ,  $900 \times 30$ ,  $9,000 \times 3$ ]  
2.  $6 \times 5 = 3,000$  [ $6 \times 500$ ,  $60 \times 50$ ,  $600 \times 5$ ]

## Computer Assisted Instruction

Mathematics Courseware Series

- Multiplication 3, Activity 1a
- Mathematics Action Games
- Pyramid Puzzler, Advanced Level

## Cooperative Learning Groups

See page 479 of this Teacher's Edition.

## Daily Maintenance

1.  $4 \times 9$  [36]      2.  $3 \times 6$  [18]  
3.  $8 \times 4$  [32]      4.  $9 \times 3$  [27]  
5.  $2 \times 7$  [14]      6.  $7 \times 9$  [63]

## Enrichment 60

Name \_\_\_\_\_ E60

**Multiplying by Parts**

Find  $24 \times 317$

Try this method for finding products.

Rewrite each factor in expanded form.

$24 = 20 + 4$   
 $317 = 300 + 10 + 7$

Write the expanded form in a chart.

Multiply to complete the chart.

Add the columns to get the partial products. Then add these.

So,  $24 \times 317 = 7,608$

Use partial products to multiply.

1.  $47 \times 412 = 19,364$

2.  $88 \times 53 = 4,664$

3.  $62 \times 915 = 56,730$

4.  $99 \times 99 = 9,801$

## Additional Resource 60

Name \_\_\_\_\_ Additional Resource 60

**Mental Math Managing Multiples**

Here's how you multiply  $40 \times 60$  mentally.

1. Multiply the lead digits.  $4 \times 6 = 24$

2. Write as many 0s as are in both factors.  $40 \times 60 = 2,400$

**Multiply mentally**

1.  $3 \times 40 = 120$       2.  $30 \times 40 = 1,200$   
3.  $4 \times 60 = 240$       4.  $40 \times 60 = 2,400$   
5.  $5 \times 50 = 250$       6.  $5 \times 500 = 2,500$   
7.  $2 \times 70 = 140$       8.  $20 \times 70 = 1,400$   
9.  $5 \times 70 = 350$       10.  $50 \times 70 = 3,500$   
11.  $5 \times 700 = 3,500$       12.  $50 \times 700 = 35,000$   
13.  $2 \times 3 \times 4 = 24$       14.  $2 \times 3 \times 40 = 240$   
15.  $2 \times 30 \times 4 = 240$       16.  $20 \times 3 \times 40 = 2,400$   
17.  $20 \times 30 \times 40 = 24,000$       18.  $200 \times 300 \times 400 = 24,000,000$

19. Circle all the exercises in the box that have the same answers as  $40 \times 60$ .

$4 \times 60$        $4 \times 2 \times 30$   
 $4 \times 600$        $(40 \times 2 \times 30)$   
 $400 \times 6$        $40 \times 20 \times 30$



## Objective 61

Estimate the product of two numbers.

### Lesson Theme

Consumer Topics: Cost of Landscaping

### Materials

- Number Lines (Teaching Aid A)
- Newspapers or catalogs

## Introduction

**Warm-Up Review** Have students use a number line to review rounding of two-digit numbers. Point out to the students that one-digit numbers usually are not rounded. Have students number the points of the first number line beginning with 0 and counting by fives to 100. Have students write each of the following numbers above the corresponding point of the number line and determine which multiple of 10 is nearest: 78 [80], 32 [30], 41 [40], 27 [30], 64 [60], 85 [90]. Remind students that numbers halfway between two multiples of 10 are rounded up.

## Using the Pages

**Teach** Read Example A. Ask whether it requires an exact answer. [No] Ask students if the cost is more than \$100. [Yes, 2 trees would cost about \$100; so 28 would be much more.] Show how to estimate by first rounding each number to the nearest ten and then multiplying. Other teaching examples:

$$8 \times 429 [3,200]$$

$$51 \times 89 [4,500]$$

**Try Mental Math** Encourage students to find the answers using mental computation.

**Error Analysis** Watch for students who round the single-digit factors in Exercises a and b to the nearest ten. Remind these students not to round single-digit factors. (See Reteaching 61.)

**Practice** Some students may need to write these exercises in rounded form before they write the product.

**Apply Problem Solving** Discuss why it makes sense to make an estimate for these types of problems. Problem 28 uses estimation in subtraction. Problem 29 is a multiple-step problem.

**List all possibilities** For Problems 30–32, encourage students to think about an organized way to list all the possible products. You might suggest that they first use 9 as the multiplier and think about the possible multipliers. [258, 285, 582, 528, 825, 852]

You can vary the problem by using any four digits.

(Continued on page 165.)

## Estimating Products: Mental Math

- A.** City workers planted 28 trees in a park. Each tree cost \$52. About how much did the trees cost in all?

Estimate  $28 \times 52$ .

$$\begin{array}{r} 28 \times 52 \\ \downarrow \quad \downarrow \\ 30 \times 50 = 1,500 \end{array}$$

Round both 28 and 52 to the nearest 10. Then multiply.

The trees cost about \$1,500 in all.

- B.** Estimate  $34 \times 62$ .

$$\begin{array}{r} 34 \times 62 \\ \downarrow \quad \downarrow \\ 30 \times 60 = 1,800 \end{array}$$

Round both 34 and 62 to the nearest 10. Then multiply.

**Discuss** Is the actual product more or less than the estimate?

**More**



## Practice 61

Name \_\_\_\_\_

What three letters make you old?

To find out, estimate each product. Each time an answer is given in a box below, cross out that box. Then write the remaining letters in order on the blanks below. Some answers are not used.

**P61**

1. $3 \times 47$	2. $52 \times 7$	3. $9 \times 68$	4. $73 \times 4$
	350	630	280
5. $61 \times 6$	6. $5 \times 91$	7. $79 \times 8$	8. $32 \times 51$
360	450	640	1,500
9. $28 \times 72$	10. $59 \times 31$	11. $22 \times 57$	12. $68 \times 43$
2,100	1,800	1,200	2,800
13. $76 \times 53$	14. $37 \times 59$	15. $22 \times 34$	16. $78 \times 12$
4,000	2,400	600	800
17. $77 \times 18$	18. $29 \times 88$	19. $46 \times 63$	20. $39 \times 81$
1,600	2,700	3,000	3,200

150	3,200	1,500	630	4,000	1,400	640	450	2,800	250	2,100	290	1,600	3,600	1,800
A	P	S	R	U	A	T	M	O	G	N	I	J	E	B
A G E														

## Reteaching 61

Name \_\_\_\_\_

All-day tickets to the amusement park cost \$12. There are 29 students in Mr. Brown's class. Estimate the cost of the tickets.

**R61**

29 × 12

Rounds up: 30 × 10 = 300

Rounds down: 29 × 12 = 348

Round 29 and 12 to the nearest 10. Multiply.

The tickets will cost about \$300.

Estimate each product.

1. $2 \times 43$	2. $6 \times 58$
86	348
3. $82 \times 9$	4. $67 \times 3$
738	201
5. $8 \times 78$	6. $39 \times 8$
624	312
7. $12 \times 22$	8. $28 \times 61$
264	1,708
9. $74 \times 67$	10. $91 \times 89$
4,958	8,099
11. $58 \times 34$	12. $32 \times 42$
1,972	1,344
13. $17 \times 28$	14. $41 \times 64$
476	2,624



## Assignment Guide

basic 1–28 odd or even, 30–32  
average 1–28 odd or even, 30–32  
enriched 1–25 odd or even, 26–32

**More Practice Set 61,**  
**page 373**

(Continued from page 164.)

**Use data from outside the text** Using data from newspapers or catalogs, have students write problems about the cost of planting a vegetable or flower garden.

## Follow-Up

**Extra Practice Estimation** Have students choose the most sensible answer by estimating the products.

- 37 × 24 678 or 888 [888]
- 46 × 72 4,422 or 3,312 [3,312]
- 61 × 92 5,612 or 6,412 [5,612]
- 41 × 63 3,543 or 2,583 [2,583]
- 45 × 32 1,440 or 1,130 [1,440]
- 31 × 58 1,798 or 1,568 [1,798]

**Reteaching** You may want to have students solve exercises not previously assigned or exercises incorrectly solved by first writing these exercises in rounded form and then finding the product. Students who are having difficulty with rounding might use number lines to help them.

**Enrichment** Have students estimate the following products and determine whether the actual product will be larger or smaller than the estimate.

- 24 × 73 [1,400, larger]
- 51 × 34 [1,500, larger]
- 97 × 86 [9,000, smaller]
- 66 × 49 [3,500, smaller]
- 71 × 21 [1,400, larger]
- 80 × 59 [4,800, smaller]

## Computer Assisted Instruction

Mathematics Courseware Series

- Multiplication 3, Activity 2

## Daily Maintenance

**Mental Math** Tell if the answer is more or less than 100.

- 3 × 30 [less]
- 4 × 50 [more]
- 2 × 60 [more]
- 4 × 20 [less]
- 3 × 40 [more]
- 2 × 30 [less]

**Try Estimation** Estimate each product.

- $58 \times 6$  **360**  $60 \times 6$
- $7 \times 81$  **560**
- $63 \times 27$  **1,800**
- $36 \times 48$  **2,000**

**Practice Estimation** Estimate each product.

- $3 \times 42$  **120**  $3 \times 40$
- $4 \times 89$  **360**  $4 \times 90$
- $19 \times 52$  **1,000**  $20 \times 50$
- $31 \times 67$  **2,100**  $30 \times 70$
- $56 \times 91$  **5,400**  $60 \times 90$
- $83 \times 2$  **160**
- $6 \times 67$  **420**
- $74 \times 27$  **2,100**
- $24 \times 81$  **1,600**
- $43 \times 55$  **2,400**
- $7 \times 35$  **280**
- $4 \times 18$  **80**
- $11 \times 92$  **900**
- $44 \times 68$  **2,800**
- $89 \times 88$  **8,100**
- $56 \times 3$  **180**
- $8 \times 42$  **320**
- $32 \times 38$  **1,200**
- $36 \times 54$  **2,000**
- $15 \times 81$  **1,600**
- $9 \times 21$  **180**
- $76 \times 5$  **400**
- $57 \times 22$  **1,200**
- $88 \times 17$  **1,800**
- $29 \times 52$  **1,500**

**Apply** Solve each problem.

**Estimation** Use estimation for Problems 26–29.

- City workers planted rose bushes that cost \$6 each. Estimate the total cost of 84 rose bushes.  
**About \$480**
- A lilac bush costs \$23. A magnolia tree costs \$87. Estimate how much more a magnolia tree costs than a lilac bush.  
**About \$70 more**
- Estimate the total cost of 25 pine trees at \$39 each.  
**About \$1,200**
- City workers planted 195 bushes that cost \$15 each and 98 flower bulbs that cost \$2 each. Estimate the total cost.  
**About \$4,200**



Using all of the digits 2, 5, 8, and 9 in the problem at the left,

- how many different products can you make?  
**24**
- what is the greatest product you can make?  
**7,668**
- what is the least product you can make?  
**1,178**

More Practice Set 61, page 373 **165**

## Enrichment 61

Name \_\_\_\_\_ E61

**Guessing Game**

Sara and Bill play a number game. They each start with 4 cards and race to see who will be first to arrange the cards in order from least to greatest.

Bill is fast, but sometimes he makes mistakes. His cards are shown below. Estimate the answers. Show the correct arrangement of the cards on the blanks provided. Write the letter names of the cards to show your answer.

Correct Arrangement

- $\begin{array}{r} 38 \\ \times 4 \\ \hline \end{array}$ 
 $\begin{array}{r} 71 \\ \times 6 \\ \hline \end{array}$ 
 $\begin{array}{r} 192 \\ \times 6 \\ \hline \end{array}$ 
 $\begin{array}{r} 213 \\ \times 4 \\ \hline \end{array}$ 
 a. b. d. c.
- $\begin{array}{r} 62 \\ \times 29 \\ \hline \end{array}$ 
 $\begin{array}{r} 284 \\ \times 4 \\ \hline \end{array}$ 
 $\begin{array}{r} 71 \\ \times 32 \\ \hline \end{array}$ 
 $\begin{array}{r} 88 \\ \times 41 \\ \hline \end{array}$ 
 b. a. c. d.
- $\begin{array}{r} 12 \\ \times 9 \\ \hline \end{array}$ 
 $\begin{array}{r} 49 \\ \times 6 \\ \hline \end{array}$ 
 $\begin{array}{r} 104 \\ \times 6 \\ \hline \end{array}$ 
 $\begin{array}{r} 39 \\ \times 82 \\ \hline \end{array}$ 
 a. b. c. d.
- $\begin{array}{r} 201 \\ \times 5 \\ \hline \end{array}$ 
 $\begin{array}{r} 32 \\ \times 61 \\ \hline \end{array}$ 
 $\begin{array}{r} 41 \\ \times 41 \\ \hline \end{array}$ 
 $\begin{array}{r} 517 \\ \times 6 \\ \hline \end{array}$ 
 a. c. b. d.

Make a set of cards and play this game.

Rules: 1. Shuffle the cards.  
2. Deal each player 4 cards, face down.  
3. Dealer says, "Go!"  
4. Race to put the cards in order.

## Additional Resource 61



### Math Poster R Estimating Products

There are 27 marbles in the cover and about 14 layers of marbles in the jar. A good estimate is  $14 \times 27$ , or 378, marbles.



## Objective 62

Multiply a two-digit number and a two-digit number.

### Lesson Theme

Computers: Careers with Computers

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Centimeter Grids (Teaching Aid K)

## Introduction

**Warm-Up Review** Point out to students that each factor in Exercises 1–3 is written in expanded form. Ask them to rewrite the exercises using standard form. Then find the product.

- $6 \times (40 + 2)$  [ $6 \times 42 = 252$ ]
- $3 \times (30 + 8)$  [ $3 \times 38 = 114$ ]
- $9 \times (100 + 10 + 8)$  [ $9 \times 118 = 1,062$ ]

Ask students to rewrite the factors in Exercises 4–5 in expanded form.

- $8 \times 72$  [ $8 \times (70 + 2)$ ]
- $5 \times 142$  [ $5 \times (100 + 40 + 2)$ ]

6. Does  $6 \times (40 + 2) = (40 + 2) \times 6$ ? Explain your answer. [In multiplication, the order in which the numbers are multiplied does not change the product.]

Have students look up the definition of the commutative property of multiplication in the Glossary.

## Using the Pages

**Teach Using Concrete Materials** Allow students time to work on and to discuss Example A. If students need help in getting started, remind them that  $11 = 10 + 1$ . Then allow more time for group work. You might want to give further help to individual groups by reminding them that they know how to multiply a two-digit number by a one-digit number, and by a multiple of ten. Then write the following on the chalkboard and discuss it in class.

$$\begin{array}{r} 12 \\ \times 11 \\ \hline 12 \quad 1 \times 12 \\ 120 \quad 10 \times 12 \\ \hline 132 \end{array}$$

Point out the corresponding part of the diagram as you write each partial product. Be sure to point out that the diagram shows  $11 \times 12 = (10 + 1) \times 12$ .

If you assign Exercises 24–25, continue the discussion of  $11 \times 12$  further. Ask students to continue working in their groups and to use grid (Continued on page 167.)

## Multiplication: Two-Digit Numbers

- A. Career** Mary Miller, a computer engineer, programmed the computer to show a blue rectangle with 11 rows of 12 squares on the screen. Work in groups of 4. Use grid paper to draw this rectangle. How can you find the number of squares without counting them individually? What is  $11 \times 12$ ? **132**  
**See Using the Pages for a discussion of this example.**

- B.** To learn about computers, Mary went to school for 20 weeks. She spent 32 hours a week in classes. How many hours did she spend in classes altogether?

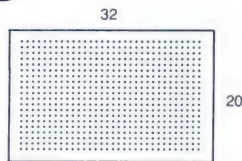
Find  $20 \times 32$ . *Estimate by rounding.  $20 \times 30 = 600$ .*

$$\begin{array}{r} 32 \\ \times 20 \\ \hline 0 \end{array}$$

Multiply by 0 ones.  
 $0 \times 32 = 0$

$$\begin{array}{r} 32 \\ \times 20 \\ \hline 640 \end{array}$$

Multiply by 2 tens.  
 $2 \text{ tens} \times 32 = 640$



Mary spent 640 hours in classes. Is this answer reasonable? Why?  
**Yes; 640 is close to the estimate of 600.**

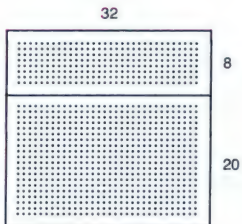
- C.** Find  $28 \times 32$ .

$$\begin{array}{r} 32 \\ \times 28 \\ \hline 256 \end{array}$$

Think of 28 as  $20 + 8$   
 $8 \times 32 = 256$

$$\begin{array}{r} 32 \\ \times 28 \\ \hline 256 \\ 640 \\ \hline 896 \end{array}$$

$20 \times 32 = 640$



$$\begin{array}{r} 32 \\ \times 28 \\ \hline 256 \\ 640 \\ \hline 896 \end{array}$$

$256 + 640 = 896$

$28 \times 32$   
 $(20 + 8) \times 32$   
↑ ↑  
Parentheses are used to show 28 as the sum of 20 + 8.

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**Try** Work in groups. Use grid paper to show each answer.

- $14 \times 16 = 224$
- $48 \times 30 = 1,440$
- $26 \times 38 = 988$

See margin.

**Practice** Multiply.

- $37 \times 40 = 1,480$
- $19 \times 80 = 1,520$
- $56 \times 30 = 1,680$
- $58 \times 17 = 986$
- $32 \times 43 = 1,376$
- $98 \times 81 = 7,938$
- $42 \times 33 = 1,386$
- $84 \times 52 = 4,368$
- $68 \times 61 = 4,148$
- $49 \times 23 = 1,127$
- $37 \times 16 = 592$
- $81 \times 44 = 3,564$
- $75 \times 40 = 3,000$
- $67 \times 20 = 1,340$
- $24 \times 90 = 2,160$
- $34 \times 25 = 850$
- $67 \times 56 = 3,752$
- $72 \times 39 = 2,808$
- $65 \times 41 = 2,665$
- $59 \times 75 = 4,425$



## Practice 62

Name: \_\_\_\_\_ P62

What do you get when you cross peanut butter with an elephant?

To find out, multiply. Find each answer in a box below. Write the word for that exercise in the box.

1. $43 \times 23 = 989$ ROOF	2. $65 \times 17 = 1,105$ A	3. $73 \times 36 = 2,628$ YOUR	4. $56 \times 54 = 3,024$ OF
5. $76 \times 65 = 4,940$ VERY	6. $81 \times 49 = 3,969$ LONG	7. $88 \times 90 = 7,920$ TO	8. $66 \times 29 = 1,914$ OR
9. $54 \times 12 = 648$ THE	10. $97 \times 95 = 9,215$ MEMORY		
11. $43 \times 41 = 1,763$ MOUTH	12. $86 \times 86 = 7,396$ STICKS		

  $\times$   = ?

AN	ELEPHANT	THAT	STICKS	TO	THE
989	3,024	2,628	1,763	1,914	PEANUT
ROOF	OF	YOUR	MOUTH	OR	
BUTTER	WITH	A	VERY	LONG	MEMORY

## Reteaching 62

Name: \_\_\_\_\_ R62

Find  $32 \times 46$ .

First multiply  $2 \times 46$ . Multiply  $30 \times 46$ . Then add.

$$\begin{array}{r} 46 \\ \times 32 \\ \hline 92 \\ 1380 \\ \hline 1472 \end{array}$$

$32 \times 46 = 1472$

Where was the Declaration of Independence signed?

Multiply. Match each letter to its answer in the blanks below.

1. $52 \times 17 = 884$ O	2. $68 \times 11 = 748$ T	3. $30 \times 31 = 930$ M
4. $25 \times 41 = 1025$ O	5. $64 \times 23 = 1472$ T	6. $73 \times 37 = 2701$ B

At the B O T T O M

2,701 1,025 748 1,472 884 1,178

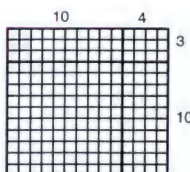


21. After you have completed Exercises 1–20, get in groups and take turns explaining why your answers are reasonable.

**Answers will vary.**

For Exercises 22–25, work in groups. Use grid paper.

22. Show  $16 \times 35 = (10 + 6) \times 35$ .  
What is  $16 \times 35$ ? **560**  
What is  $(10 \times 35) + (6 \times 35)$ ? **560**  
**See margin.**
23. Show  $35 \times 16 = (30 + 5) \times 16$ .  
**See margin.**
24. Show  $35 \times 16 = (30 + 5) \times (10 + 6)$ .  
**See margin.**
25. Look at the figure at the right. How many squares are there? Write a sentence to show this. Compare your sentences. Are they the same? If not, explain your sentences to one another.  
**See margin.**



**Apply** Solve each problem.

26. Mary worked with a magnetic printer that printed 87 lines per minute. How many lines can it print in 60 minutes?  
**About 5,220 lines**
27. Mary worked 48 hours last week and 39 hours this week. How many more hours did she work last week?  
**9 more hours**
28. **Estimation** A printer printed 88 characters per second for 42 seconds. Estimate how many characters it printed.  
**About 3,600 characters**
29. A laser printer prints 12,000 lines per minute. How many lines can it print in 30 minutes? **360,000 lines**
30. **Thinking skills** Explain an easy way to multiply  $2 \times 16 \times 50$ .  
**See margin.**
31. **Find the facts.** Work with another student. Discuss how to get an estimate for the number of letters on a page in a book. Then choose a book. Select a page in it and give an estimate of the number of letters on that page.  
**Answers will vary.**



More Practice Set 62, page 373 167

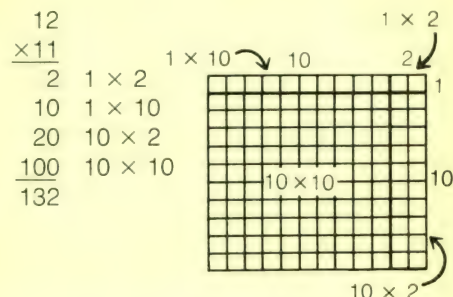
## Assignment Guide

basic	1–21 odd, 26–30
average	1–20 even, 21–23, 26–31
enriched	1–20 odd or even, 21–31

**More Practice Set 62, page 373**

(Continued from page 166.)

paper to show that  $11 \times 12 = (10 + 1) \times (10 + 2)$ .



Point out the corresponding part of the diagram as you write partial products.

**Try** Have students show their work as it is shown in Example C. Students will use the second type of diagram (See Teach.) only if they will be assigned Exercises 24–25.

**Apply Problem Solving** For Problem 31, students can count the letters in one line and then multiply by the number of lines on the page.

## Follow-Up Reteaching

Have students solve exercises not previously assigned or solved incorrectly by rewriting the exercises first using expanded form.

$$\begin{array}{r} 1. \quad 40 + 7 \\ \times \quad 30 \\ \hline [1,200 + 210 = 1,410] \end{array} \quad \begin{array}{r} 47 \\ \times 30 \\ \hline [1,410] \end{array}$$

$$\begin{array}{r} 2. \quad 50 + 2 \\ \times \quad 20 + 7 \\ \hline 350 + 14 = 364 \\ 1,000 + 40 = 1,040 \\ \hline 1,404 \end{array} \quad \begin{array}{r} 52 \\ \times 27 \\ \hline 364 \\ 1,040 \\ \hline 1,404 \end{array}$$

## Computer Assisted Instruction

Mathematics Courseware Series

- Multiplication 3, Activities 1b, 3

## Daily Maintenance

**Mental Math** Before students compute, ask them to predict which products will be greater than 100.

$$\begin{array}{ll} 1. 6 \times 18 & [108] \\ 3. 8 \times 14 & [112] \\ 5. 2 \times 46 & [92] \end{array} \quad \begin{array}{ll} 2. 5 \times 23 & [115] \\ 4. 4 \times 19 & [76] \\ 6. 3 \times 38 & [114] \end{array}$$

**Answers, pages 166–167**

**See page 177 of this Teacher's Edition.**

## Enrichment 62

Name: \_\_\_\_\_ E62

**Exponents**

You can show that 16 is a square number by writing an exponent.

Or, you can show that 16 is a square number by writing an exponent.

4 × 4 = 16

4<sup>2</sup> = 16

4 is used as a factor 2 times. 4<sup>2</sup> is read four squared.

Find these square numbers.

1. 3 <sup>2</sup> = 9	2. 8 <sup>2</sup> = 64	3. 1 <sup>2</sup> = 1
4. 12 <sup>2</sup> = 144	5. 10 <sup>2</sup> = 100	6. 15 <sup>2</sup> = 225
7. 21 <sup>2</sup> = 441	8. 25 <sup>2</sup> = 625	9. 50 <sup>2</sup> = 2,500

Complete the table.

Factors	Factor with an Exponent	Product
2 × 2	2 <sup>2</sup>	4
11 × 11	11 <sup>2</sup>	121
4 × 4	4 <sup>2</sup>	16
7 × 7	7 <sup>2</sup>	49
6 × 6	6 <sup>2</sup>	36
5 × 5	5 <sup>2</sup>	25
10 × 10	10 <sup>2</sup>	100

## Additional Resource 62

Name: \_\_\_\_\_ Additional Resource 62

**Calculator Creating Products**

Use me to try out factors to make different products.

Use the digits 1, 2, 3, and 4 to make up factors that give different products.

Example:  $1 \times 2 = 2$

See how many different products you can make.

Answers will vary, and the order of the answers may vary.

1. $1 \times 2 = 2$	2. $1 \times 3 = 3$
3. $1 \times 4 = 4$	4. $2 \times 3 = 6$
5. $2 \times 4 = 8$	6. $3 \times 4 = 12$
7. $1 \times 3 = 3$	8. $1 \times 4 = 4$
9. $2 \times 3 = 6$	10. $2 \times 4 = 8$

Use the digits 1, 3, 3, and 4 to make up factors that give different products.

11. $1 \times 3 = 3$	12. $4 \times 3 = 12$
13. $3 \times 3 = 9$	14. $3 \times 4 = 12$
15. $3 \times 3 = 9$	16. $3 \times 4 = 12$



## Objective 63

Multiply a three-digit number and a two-digit number.

### Lesson Theme

Computers: Capabilities of Computers

### Introduction

**Warm-Up Review** Use the following exercises to review multiplication of three-digit numbers by one-digit numbers and multiples of 10:  $7 \times 237$  [1,659],  $40 \times 620$  [24,800],  $4 \times 453$  [1,812].

**Motivational Situation** Pose the following problem to students. Suppose that you owned a factory that manufactures cars and you wanted to buy a robot. What information would you want to know about the robot? [What does it do? How fast can it do it? How do I make it work? How much does it cost? Would it cost less to hire people to do the same job?]

### Using the Pages

**Teach** Read and discuss each example. Point out that the students already know how to do the computation process, only now they will be multiplying a three-digit number.

**Estimation** Have students use the technique presented in Example B to give a range for the product in each of the additional teaching examples below. Then ask them to predict whether the actual product will be nearer to the smaller number or the greater number in the range.

Other teaching examples:

$\begin{array}{r} 307 \\ \times 15 \\ \hline \end{array}$	$\begin{array}{r} 618 \\ \times 90 \\ \hline \end{array}$	$\begin{array}{r} 924 \\ \times 37 \\ \hline \end{array}$
[4,605]	[55,620]	[34,188]

**Try** Students should be encouraged to cross out the "carried" digits from the first partial product before writing those for the second partial product.

**Practice Error Analysis** In Exercise 3 watch for students who forget to multiply by 0 ones. Students making this error might be asked to compute  $3 \times 243$  and compare the product to that of  $30 \times 243$ .

Remind students that they can use rounding or a range to estimate the answers for Exercise 19.

**Apply Problem Solving** Ask students to estimate the answer to Problem 20 by finding a range. [300,000–800,000]

**Mental Math** Remind students that when they multiply multiples of 10, 100, or 1,000, there is only one nonzero digit in each factor. Therefore, they should first multiply the nonzero digits and then annex as many zeros as there are in both factors.

## Multiplication: Two-Digit and Three-Digit Numbers

- A. Computer-controlled robots are used in many factories. In 1982, Great Britain had about 500 programmable robots. Japan had 28 times as many. About how many programmable robots did Japan have?

Find  $28 \times 500$ .

Estimate using rounding.

$$30 \times 500 = \text{■ } 15,000$$

$\begin{array}{r} 500 \\ \times 28 \\ \hline 4000 \\ 10000 \\ \hline 14000 \end{array}$	$8 \times 500 = 4,000$
	$20 \times 500 = 10,000$
	$4,000 + 10,000 = 14,000$

In 1982, Japan had about 14,000 programmable robots.

Is this answer reasonable? How can you tell? Why is it important to determine an approximate answer before multiplying? **Yes; it is close to the estimated answer; it is a quick way to check if an answer is reasonable.**

- B. Find  $35 \times 146$ .

$\begin{array}{r} 146 \\ \times 35 \\ \hline 730 \\ 4380 \\ \hline 5110 \end{array}$	<p>An estimate can be a range.</p> <p>Round both numbers down.</p> <p><math>30 \times 100 = 3,000</math></p> <p>Round both numbers up.</p> <p><math>40 \times 200 = 8,000</math></p> <p>The product is between 3,000 and 8,000.</p>
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### Practice 63

Name: \_\_\_\_\_ P63

Complete the cross-number puzzle.

Across	<p>1. <math>\begin{array}{r} 465 \\ \times 12 \\ \hline \end{array}</math> 5,580</p> <p>3. <math>\begin{array}{r} 289 \\ \times 46 \\ \hline \end{array}</math> 13,294</p> <p>7. <math>\begin{array}{r} 236 \\ \times 34 \\ \hline \end{array}</math> 8,024</p> <p>12. <math>\begin{array}{r} 626 \\ \times 52 \\ \hline \end{array}</math> 32,552</p>	<p>2. <math>\begin{array}{r} 326 \\ \times 16 \\ \hline \end{array}</math> 5,216</p> <p>4. <math>\begin{array}{r} 514 \\ \times 82 \\ \hline \end{array}</math> 42,148</p> <p>6. <math>\begin{array}{r} 612 \\ \times 93 \\ \hline \end{array}</math> 56,916</p> <p>8. <math>\begin{array}{r} 569 \\ \times 87 \\ \hline \end{array}</math> 49,503</p>
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Down

<p>5. <math>\begin{array}{r} 315 \\ \times 25 \\ \hline \end{array}</math> 7,875</p> <p>9. <math>\begin{array}{r} 725 \\ \times 94 \\ \hline \end{array}</math> 68,150</p> <p>11. <math>\begin{array}{r} 909 \\ \times 76 \\ \hline \end{array}</math> 69,084</p>	<p>10. <math>\begin{array}{r} 717 \\ \times 77 \\ \hline \end{array}</math> 55,209</p> <p>13. <math>\begin{array}{r} 295 \\ \times 13 \\ \hline \end{array}</math> 3,835</p>
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### Reteaching 63

Name: \_\_\_\_\_ R63

Find  $21 \times 136$ .

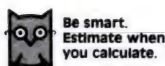
First multiply	Multiply	Then add
$\begin{array}{r} 136 \\ \times 21 \\ \hline 136 \\ 2720 \\ \hline \end{array}$	$\begin{array}{r} 20 \times 136 \\ \hline \begin{array}{r} 136 \\ \times 20 \\ \hline 2720 \end{array} \end{array}$	$\begin{array}{r} 136 \\ \times 1 \\ \hline 136 \\ \hline \end{array}$
$21 \times 136 = 2,856$		

Multiply

1. $\begin{array}{r} 216 \\ \times 12 \\ \hline \end{array}$ 2592	2. $\begin{array}{r} 182 \\ \times 14 \\ \hline \end{array}$ 2548	3. $\begin{array}{r} 327 \\ \times 13 \\ \hline \end{array}$ 4251	4. $\begin{array}{r} 314 \\ \times 26 \\ \hline \end{array}$ 8164
5. $\begin{array}{r} 321 \\ \times 29 \\ \hline \end{array}$ 9309	6. $\begin{array}{r} 492 \\ \times 31 \\ \hline \end{array}$ 15252	7. $\begin{array}{r} 541 \\ \times 62 \\ \hline \end{array}$ 33542	8. $\begin{array}{r} 621 \\ \times 47 \\ \hline \end{array}$ 29187
9. $\begin{array}{r} 212 \\ \times 23 \\ \hline \end{array}$ 4876	10. $\begin{array}{r} 341 \\ \times 42 \\ \hline \end{array}$ 14322	11. $\begin{array}{r} 731 \\ \times 52 \\ \hline \end{array}$ 38012	12. $\begin{array}{r} 931 \\ \times 38 \\ \hline \end{array}$ 35378



## Try Multiply.



a.  $400 \times 62 = 24,800$   
 b.  $108 \times 74 = 7,992$   
 c.  $320 \times 18 = 5,760$

## Practice Multiply.

1.  $300 \times 41 = 12,300$   
 2.  $800 \times 35 = 28,000$   
 3.  $243 \times 30 = 7,290$   
 4.  $317 \times 40 = 12,680$   
 5.  $103 \times 65 = 6,695$   
 6.  $370 \times 81 = 29,970$   
 7.  $432 \times 13 = 5,616$   
 8.  $826 \times 44 = 36,344$   
 9.  $707 \times 29 = 20,503$   
 10.  $281 \times 18 = 5,058$   
 11.  $195 \times 32 = 6,240$   
 12.  $275 \times 64 = 17,600$   
 13.  $324 \times 96 = 31,104$   
 14.  $807 \times 75 = 60,525$   
 15.  $765 \times 42 = 32,130$   
 16.  $581 \times 39 = 22,659$   
 17.  $819 \times 53 = 43,407$   
 18.  $565 \times 65 = 36,725$

19. Get together with three other students and explain to one another why your answers to Exercises 1–18 are reasonable.

Answers will vary.

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used. Explain to another student why you chose that method.

20. A robot can assemble a part in 110 seconds. How long will it take the robot to assemble 3,115 parts?  
**342,650 seconds; C**
21. If a robot worked 16 hours per day, how many hours would it work in 365 days?  
**5,840 hours; P, C**
22. A robot can handle 400 machine parts per hour. How many parts could it handle in 20 hours?  
**8,000 parts; M**
23. The first mechanical adding machine was made in 1642. Robots first worked in factories 315 years later. What year was this?  
**1957; P**
24. A certain robot can move 19 feet per second. Can it move 1,000 feet in 50 seconds?  
**No; M**
25. One type of robot can weld 50 connections per minute. How many connections can this robot weld in 60 minutes?  
**3,000 connections; M**

Using Problem-Solving Strategies, page 420  
 More Practice Set 63, page 374 **169**

## Assignment Guide

basic 1–18 odd, 19–25  
 average 1–18 even, 19–25  
 enriched 7–25

**More Practice Set 63, page 374**

## Follow-Up

**Extra Practice** For fun, have each student

- write the number of the month of his or her birthday.
- multiply by 5.
- add 6.
- multiply by 4.
- add 9.
- multiply by 5.
- add the number of the day of his or her birthday.
- subtract 165.

[The answer tells the month and day of the student's birthday—the first one or two digits tell the month and the last one or two digits tell the day.]

**Reteaching** Have students make flashcards of the multiplication facts they do not know and use them for practice with each other.

## Reading and Writing Mathematics

Have students write two sentences using the word *product*. One sentence should use an everyday meaning of the word and the other sentence should use the mathematical meaning of the word. [Answers will vary. Example: A new product was advertised in the magazine. The product of 6 and 4 is 24.]

## Computer Assisted Instruction

Mathematics Courseware Series  
 • Multiplication 3, Activity 4

## Enrichment 63

Name \_\_\_\_\_ E63

**Missing Factors**

Give the missing factors. For each exercise, find the missing factors in the box below the exercise. Shade the regions in the puzzle below that contain your answers to find. "What state is high in the middle and round on both ends?"

1.  $27 \times 263 = 7,101$   
 2.  $13 \times 497 = 6,461$

3.  $48 \times 536 = 25,728$   
 4.  $84 \times 601 = 50,484$

5.  $8 \times 555 = 4,440$   
 6.  $27 \times 927 = 25,029$

## Additional Resource 63

Name \_\_\_\_\_ Additional Resource 63

**Project Tic-Tac-Toe Products**

Materials needed: two different-colored pencils; paper

Number of players: 2

Play tic-tac-toe. Each player has a colored pencil. Take turns choosing a square and giving the product. The first player to get three products in a row—across, down, or diagonally—wins.

$54 \times 32 = 1,728$	$34 \times 60 = 2,040$	$23 \times 80 = 1,840$
$41 \times 60 = 2,460$	$22 \times 88 = 1,936$	$77 \times 14 = 1,078$
$84 \times 18 = 1,512$	$36 \times 71 = 2,556$	$19 \times 65 = 1,235$
$41 \times 63 = 2,583$	$56 \times 74 = 4,144$	$75 \times 31 = 2,325$
$25 \times 90 = 2,250$	$67 \times 31 = 2,077$	$32 \times 50 = 1,600$
$82 \times 30 = 2,460$	$84 \times 51 = 4,284$	$98 \times 20 = 1,960$

## Daily Maintenance

**Mental Math** Encourage students to do these exercises mentally. Remind them of the techniques discussed on page 85.

- $783 - 16$  [767]
- $513 - 44$  [469]
- $342 - 59$  [283]
- $\$5.65 - \$3.98$  [\$1.67]
- $\$9.49 - \$8.92$  [\$0.57]
- $\$35.18 - \$27.09$  [\$8.09]

**Using Problem-Solving Strategies, page 420**



## Using Problem-Solving Strategies

- Draw a diagram.
- Try and check.
- Make a table.
- Work backward.
- Use logical reasoning.

### Introduction

These problems give students an opportunity to use a variety of strategies.

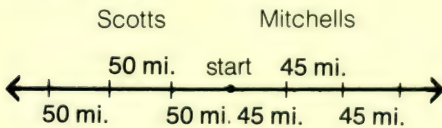
### Using the Pages

While students are working in small groups, observe which strategies are being used. If a group is having difficulty with a particular problem, ask questions that might help them to get started, or suggest that they try a different problem. Suggest a specific strategy only if it is necessary.

To solve Problem 1, students may make a table.

	Betty's savings	Tom's savings
Start	\$24	\$12
Week 1	27	17
Week 2	30	22
Week 3	33	27
Week 4	36	32
Week 5	39	37
Week 6	42	42

For Problem 2, some students may draw a diagram.

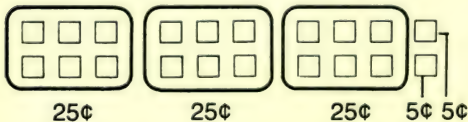


The Scotts' total distance in 3 hours is 150 miles.      The Mitchells' total distance in 3 hours is 135 miles.

Adding the two distances gives 285 miles. This information might be organized in a table.

Hours	Miles driven by Mitchells	Miles driven by Scotts	Total miles
1	45	50	95
2	90	100	190
3	135	150	285

For Problem 3, students might draw 20 postcards. By circling groups of 6 postcards and recording the cost, students can determine the total cost.

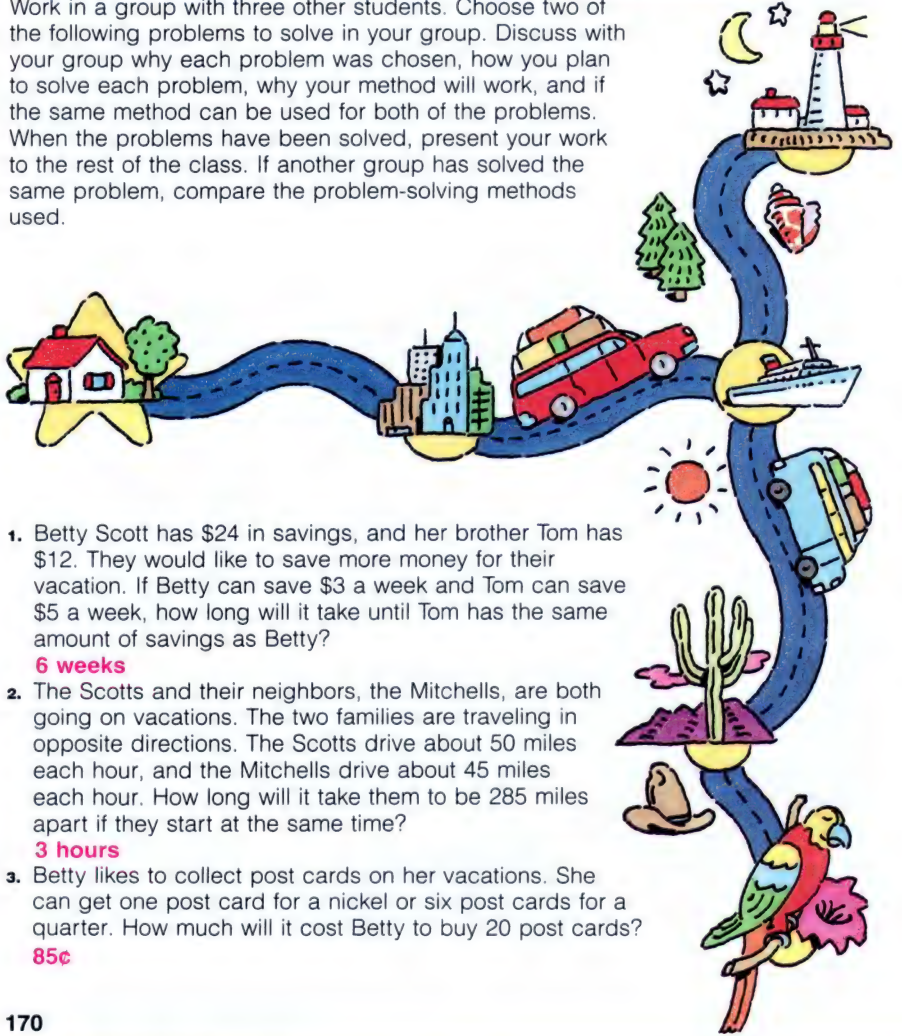


(Continued on page 171.)

## Using Problem-Solving Strategies

# FAMILY VACATIONS

Work in a group with three other students. Choose two of the following problems to solve in your group. Discuss with your group why each problem was chosen, how you plan to solve each problem, why your method will work, and if the same method can be used for both of the problems. When the problems have been solved, present your work to the rest of the class. If another group has solved the same problem, compare the problem-solving methods used.



1. Betty Scott has \$24 in savings, and her brother Tom has \$12. They would like to save more money for their vacation. If Betty can save \$3 a week and Tom can save \$5 a week, how long will it take until Tom has the same amount of savings as Betty?

**6 weeks**

2. The Scotts and their neighbors, the Mitchells, are both going on vacations. The two families are traveling in opposite directions. The Scotts drive about 50 miles each hour, and the Mitchells drive about 45 miles each hour. How long will it take them to be 285 miles apart if they start at the same time?

**3 hours**

3. Betty likes to collect post cards on her vacations. She can get one post card for a nickel or six post cards for a quarter. How much will it cost Betty to buy 20 post cards?

**85¢**





4. The first day, Tom bought 1 souvenir. The second day, he bought 2 souvenirs. The third day, he bought 3 souvenirs, and so on. How many souvenirs did Tom buy after 7 days on vacation?  
**28 souvenirs**
5. Betty also bought some souvenirs. At one store, she spent one half of her money. Then she went to another store and spent one half of what was left. After that, she had 24 cents. How much money did she have at the start?  
**96¢**
6. The Scotts stopped to camp for a few days. Tom and Betty went to cut some firewood. If it takes 12 minutes to cut a log into 3 pieces, how long will it take to cut a log into 4 pieces?  
**18 minutes**
7. Mr. Scott, Tom, and Betty are trying to get across a river in a small boat that holds only 150 pounds at a time. Mr. Scott weighs 150 pounds; Tom weighs 85 pounds; and Betty weighs 65 pounds. How can all three get across the river?  
**See Using the Pages.**

## COMPUTER

### BASIC: REM Statements

REM statements allow remarks to be put into a program. These remarks are for the person reading the program. The computer ignores REM statements. A REM statement may be anywhere in a program before END and must have a line number.

```
10 REM MULTIPLY BY 5
20 PRINT 10*5;
30 PRINT 15*5;
40 PRINT 22*5
50 END
```

1. Tell what would be printed for the program above.  
**50 75 110**
2. Write a program that will print your name, age, and grade on separate lines. Use a REM statement before each PRINT statement. **Answers will vary. See margin for sample.**
3. Tell what would be printed for the program you wrote for Exercise 2. **Answers will vary. See margin for sample.**
4. Write a program that will print the answers to the following exercises on one line. Use a REM statement to give a brief description of the program.  
 $212 \times 34$     $331 \times 23$     $525 \times 12$   
**See margin.**
5. Tell what would be printed for the program you wrote for Exercise 4.  
**7208 7613 6300**

## Assignment Guide

basic	Any 2 problems
average	Any 2 problems
enriched	Any 2 problems

(Continued from page 170.)

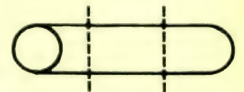
For Problem 4, students might make a table showing the total number of souvenirs each day.

Day	Number of souvenirs
1	1
2	$1 + 2 = 3$
3	$3 + 3 = 6$
4	$6 + 4 = 10$
5	$10 + 5 = 15$
6	$15 + 6 = 21$
7	$21 + 7 = 28$

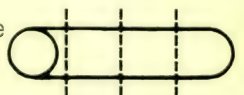
*Working backward* is a useful strategy for Problem 5. Betty has 24 cents. Before spending her money at the second store, she had 48 cents. Therefore, before spending her money in the first store, she had 96 cents. You might want to have students act out the situation with play money.

One way to solve Problem 6 is to draw diagrams.

Two cuts will give 3 pieces. Each cut takes 6 minutes.



Three cuts will give 4 pieces. Each cut takes 6 minutes.



It will take 18 minutes to cut 4 pieces.

Students use *logical reasoning* to solve Problem 7. If Mr. Scott takes the boat across first, there would be no way to get the boat back, other than Mr. Scott taking it back. If Tom and Betty take the boat across the river, one could stay and the other could take the boat back. Since both Mr. Scott and a child cannot be in the boat together, the child must get out, and Mr. Scott can take the boat across. Mr. Scott gets out, and the remaining child takes the boat back to pick up the other child.

### Daily Maintenance

Tell what each 5 means.

1. 657 [5 tens or 50]
2. 4,165 [5 ones or 5]
3. 50,722 [5 ten-thousands or 50,000]
4. 5,786,241 [5 millions or 5,000,000]
5. 62,599 [5 hundreds or 500]
6. 115,740 [5 thousands or 5,000]
7. 9,500,001 [5 hundred-thousands or 500,000]

### Answers, page 171

#### Computer

2. 10 REM NAME  
20 PRINT "JOHN DOE"  
30 REM AGE  
40 PRINT "10"  
50 REM GRADE  
60 PRINT "4"  
70 END
3. JOHN DOE  
10  
4
4. Answers will vary. A sample is given.  
10 REM MULTIPLICATION  
20 PRINT  $212 \times 34$ ;  
30 PRINT  $331 \times 23$ ;  
40 PRINT  $525 \times 12$   
50 END



## Objective 64

Multiply an amount of money by a one- or two-digit number.

### Lesson Theme

Recreation: Sports

### Materials

- Play Money (Punchouts)

## Introduction

**Warm-Up Review** Ask students for examples of times they have spent money. Then write different money amounts on the board and have students practice reading them.

## Using the Pages

**Teach** Allow students to work through Example A on their own. For students who are having difficulty, suggest that they begin by exchanging pennies for nickels, then nickels for dimes, dimes for quarters, and so on. When students have finished, ask how they would write the answer. [\$5.46]

For Example B, point out that students should always round up when they need to be sure they have enough. Remind students to multiply money as they would multiply whole numbers in Example C. Be sure they write the dollar sign and position the decimal point two places from the right.

**Mental Math** In Example D, students are shown how to use the distributive property to multiply money mentally. They can use this skill for Exercises 11–14.

**Try** For Exercise E, discuss with students why 97¢ is entered into the calculator as .97. [It represents 97/100 of a dollar.] Stress that the calculator display will not show a dollar sign, but that students should write the dollar sign in their answers.

### Practice Choosing a computation method

Tell students who choose to use calculators that the calculator will not display zeros to the right of the decimal point in Exercises 18, 19, and 20. Remind them to write the zeros when they record their answers.

**Apply Problem Solving** Remind students to round the cost of a pennant up in Problem 29. Suggest that when their estimates are very close to the given amount they have, students should compute an exact answer.

## Multiplication: Money



See Using the Pages for a discussion of this example.

- A.** Beto and Lina each earned \$2.73. How much do they have in all?

Use play money to display \$2.73 on your desk. Combine your money with that of another student who has \$2.73. Exchange coins for dollar bills as much as possible in order to find the total amount of money.

Explain how you combined the coins and bills and then exchanged coins for bills. Were you concerned with the decimal point? **No**

What is  $2 \times \$2.73$ ? **\$5.46**

Beto and Lina went to see a professional baseball game at the Astrodome in Houston. Each ticket cost \$3.50.

- B.** Would \$10.00 be enough to pay for two tickets?

When determining how much money is needed, estimate to the next higher dollar. Why? **To be sure of having enough money.**

\$3.50 rounds to \$4.00.

$$2 \times \$4.00 = \$8.00$$

\$10.00 would be enough for two tickets.

- C.** How much did they actually pay for the two tickets?

$$\text{Find } 2 \times \$3.50.$$

Think of \$3.50 as 350 cents. Multiply. Write the answer in dollars and cents.

$$\begin{array}{r} \$3.50 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 350 \\ \times 2 \\ \hline 700 \end{array} \quad \begin{array}{r} \$3.50 \\ \times 2 \\ \hline \$7.00 \end{array}$$

Beto and Lina paid \$7.00 for the two tickets.

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## Practice 64

Name: \_\_\_\_\_ P64

Multiply.

1. $\begin{array}{r} \$0.04 \\ \times 8 \\ \hline \end{array}$	2. $\begin{array}{r} \$1.75 \\ \times 6 \\ \hline \end{array}$	3. $\begin{array}{r} \$7.68 \\ \times 5 \\ \hline \end{array}$	4. $\begin{array}{r} \$0.63 \\ \times 9 \\ \hline \end{array}$
<b>\$0.32</b>	<b>\$10.50</b>	<b>\$38.40</b>	<b>\$5.67</b>
5. $\begin{array}{r} \$0.34 \\ \times 21 \\ \hline \end{array}$	6. $\begin{array}{r} \$2.60 \\ \times 16 \\ \hline \end{array}$	7. $\begin{array}{r} \$0.62 \\ \times 15 \\ \hline \end{array}$	8. $\begin{array}{r} \$0.05 \\ \times 10 \\ \hline \end{array}$
<b>\$7.14</b>	<b>\$41.60</b>	<b>\$9.30</b>	<b>\$0.50</b>
9. $\begin{array}{r} \$0.49 \\ \times 31 \\ \hline \end{array}$	10. $\begin{array}{r} \$6.25 \\ \times 22 \\ \hline \end{array}$	11. $\begin{array}{r} \$5.78 \\ \times 40 \\ \hline \end{array}$	12. $\begin{array}{r} \$9.08 \\ \times 11 \\ \hline \end{array}$
<b>\$15.19</b>	<b>\$137.50</b>	<b>\$231.20</b>	<b>\$99.88</b>

Use the prices listed in the table at the right to find the cost of

SCHOOL SUPPLIES	
Item	Price
Notebook	\$1.59
Metric ruler	\$0.25
Felt-tip pen	\$0.79
Box of colored pencils	\$2.19

13. 3 notebooks. **\$4.77**

14. 12 metric rulers. **\$3.00**

15. a felt-tip pen and a box of pencils. **\$2.98**

## Reteaching 64

Name: \_\_\_\_\_ R64

Con bought 3 rolls of film. Each roll of film cost \$2.19. How much did Con pay for the film?

Find  $3 \times \$2.19$ .

$\begin{array}{r} 219 \\ \times 3 \\ \hline 657 \end{array}$  **\$2.19** Multiply as with whole numbers.

How does a duck eat soup?

Multiply. Match each letter to its answer in the blanks below.

1. $\begin{array}{r} \$0.63 \\ \times 2 \\ \hline \end{array}$	2. $\begin{array}{r} \$3.04 \\ \times 4 \\ \hline \end{array}$	3. $\begin{array}{r} \$2.41 \\ \times 3 \\ \hline \end{array}$	4. $\begin{array}{r} \$0.86 \\ \times 6 \\ \hline \end{array}$
<b>\$1.26</b> A	<b>\$12.16</b> Y	<b>\$7.23</b> C	<b>\$5.16</b> I
5. $\begin{array}{r} \$1.27 \\ \times 4 \\ \hline \end{array}$	6. $\begin{array}{r} \$6.41 \\ \times 3 \\ \hline \end{array}$	7. $\begin{array}{r} \$1.52 \\ \times 4 \\ \hline \end{array}$	8. $\begin{array}{r} \$2.37 \\ \times 3 \\ \hline \end{array}$
<b>\$5.08</b> H	<b>\$19.23</b> K	<b>\$6.08</b> B	<b>\$7.11</b> R
9. $\begin{array}{r} \$0.32 \\ \times 11 \\ \hline \end{array}$	10. $\begin{array}{r} \$0.41 \\ \times 22 \\ \hline \end{array}$	11. $\begin{array}{r} \$0.37 \\ \times 13 \\ \hline \end{array}$	12. $\begin{array}{r} \$0.53 \\ \times 26 \\ \hline \end{array}$
<b>\$3.52</b> U	<b>\$9.02</b> E	<b>\$4.81</b> W	<b>\$13.78</b> G

W I T H  
\$4.81 \$5.16 \$12.16 \$5.08  
Q U A C K E R S  
\$13.78 \$3.52 \$1.26 \$7.23 \$19.23 \$9.02 \$7.11 \$6.08





d. Find  $3 \times 42\text{¢}$ . **Mental Math**

You can multiply mentally by thinking of  $42\text{¢}$  as  $40\text{¢} + 2\text{¢}$ .  
 $(3 \times 40) + (3 \times 2)$   
 $120 + 6 = 126$   
 Write the answer as dollars and cents. \$1.26

**Try** Multiply. Use play money for Exercises a–c.

a.  $\begin{array}{r} \$0.06 \\ \times 7 \\ \hline \end{array}$   
**\$0.42**

b.  $\begin{array}{r} \$0.15 \\ \times 11 \\ \hline \end{array}$   
**\$1.65**

c.  $\begin{array}{r} \$1.39 \\ \times 6 \\ \hline \end{array}$   
**\$8.34**

d.  $14 \times \$4.08$   
**\$57.12**

e. **Calculator**  $7 \times 97\text{¢}$   
 Press: 7  $\times$  97 =  
**Display: 6.79 \$6.79**

**Practice** Multiply.

1.  $\begin{array}{r} \$0.02 \\ \times 4 \\ \hline \end{array}$   
**\$0.08**

2.  $\begin{array}{r} \$0.27 \\ \times 3 \\ \hline \end{array}$   
**\$0.81**

3.  $\begin{array}{r} \$0.81 \\ \times 9 \\ \hline \end{array}$   
**\$7.29**

4.  $\begin{array}{r} \$1.33 \\ \times 6 \\ \hline \end{array}$   
**\$7.98**

5.  $\begin{array}{r} \$4.05 \\ \times 7 \\ \hline \end{array}$   
**\$28.35**

6.  $\begin{array}{r} \$8.60 \\ \times 35 \\ \hline \end{array}$   
**\$301.00**

7.  $\begin{array}{r} \$0.13 \\ \times 28 \\ \hline \end{array}$   
**\$3.64**

8.  $\begin{array}{r} \$0.75 \\ \times 14 \\ \hline \end{array}$   
**\$10.50**

9.  $\begin{array}{r} \$1.50 \\ \times 61 \\ \hline \end{array}$   
**\$91.50**

10.  $\begin{array}{r} \$7.36 \\ \times 15 \\ \hline \end{array}$   
**\$110.40**

**Mental math** Multiply mentally. Write only the product.

11.  $9 \times 51\text{¢}$   
**\$4.59**

12.  $3 \times 83\text{¢}$   
**\$2.49**

13.  $2 \times 64\text{¢}$   
**\$1.28**

14.  $4 \times 52\text{¢}$   
**\$2.08**

**Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math  
 Choose a method to find each product. Tell which method you used.

15.  $16 \times \$0.43$   
**\$6.88; P, C**

16.  $47 \times \$0.29$   
**\$13.63; P, C**

17.  $38 \times \$1.07$   
**\$40.66; P, C**

18.  $4 \times \$2.50$   
**\$10; M**

19.  $20 \times \$0.58$   
**\$11.60; P**

20.  $70 \times \$0.36$   
**\$25.20; P**

21.  $14 \times \$2.49$   
**\$34.86; P, C**

22.  $67 \times \$3.65$   
**\$244.55; P, C**

**Apply** Use data from a table. Use the prices to find the cost of

Item	Price
Program	\$1.25
Pennant	\$2.95
Hat	\$3.75
T-shirt	\$6.50
Baseball Card	\$0.05

23. 4 pennants.  
**\$11.80**

24. 10 programs.  
**\$12.50**

25. 6 hats.  
**\$22.50**

26. 20 baseball cards  
**\$1.00**

27. a hat and a T-shirt  
**\$10.25**

28. 3 hats and 6 T-shirts.  
**\$50.25**

29. Jeremy wants to buy 7 pennants. Can he pay for them with a twenty-dollar bill? Explain why or why not.  
**No; he needs 65 cents more.**

30. **Calculator** Mr. Drew bought one of each item for each of his 3 grandchildren. What was the total cost?  
**\$43.50**

More Practice Set 64, page 374 **173**

## Assignment Guide

basic 1–10 even, 11–30  
 average 1–10 odd, 11–30  
 enriched 1–10 odd or even, 11–30

**More Practice Set 64, page 374**

## Homework to do with others

**Estimation** With the help of an adult, have each student estimate the cost of a trip to a game of the nearest major league baseball team. Remind students to discuss more than the cost of tickets and souvenirs with the adult. Ask each student to prepare a short chart for display in class.

## Follow-Up

**Extra Practice** Use data from outside the text Have students use newspaper and magazine advertisements showing prices of items. Suggest that they make up multiplication word problems involving the purchase of several of one kind of item, and then have them find the total cost. The cost of any one item should be less than \$10.00

**Reteaching** Have students use play money to find answers to the exercises in the lesson.

**Enrichment** Use data from outside the text Have students use a catalog that lists school or hobby supplies. Have them plan how they would spend \$100.00 for the supplies, if each person in the class is to get one of some items and groups of 3, 4 or 5 students can share other items.

## Enrichment 64

Name \_\_\_\_\_ E64

**Do I Have Enough Money?**

Maria is the cashier for her school's plant sale. She must multiply to find the total cost of each purchase and then subtract to find the amount of change. Some of the students do not have enough money to pay for what they want to buy.

Find the total cost of each purchase. Then find the amount the customer should receive in change, or the amount more that the customer needs. Circle change or amount more.

1. Ivy \$0.88  
 Plants bought: 4  
 Amount paid: \$5.00  
 Cost: \$3.52  
 Change: \$1.48  
 Amount more

2. Fern \$2.15  
 Plants bought: 3  
 Amount paid: \$5.00  
 Cost: \$6.45  
 Change: \$1.45  
 Amount more

3. Cactus \$1.04  
 Plants bought: 5  
 Amount paid: \$5.00  
 Cost: \$5.20  
 Change: \$0.20  
 Amount more

4. Spider \$1.59  
 Plants bought: 7  
 Amount paid: \$12.00  
 Cost: \$11.13  
 Change: \$0.87  
 Amount more

5. Tomato \$2.65  
 Plants bought: 8  
 Amount paid: \$15.00  
 Cost: \$21.20  
 Change: \$6.20  
 Amount more

6. Bean \$0.79  
 Plants bought: 6  
 Amount paid: \$10.00  
 Cost: \$4.74  
 Change: \$5.26  
 Amount more

## Additional Resource 64



**Math Poster AA Multiplication: Money** The fish store sold 3 guppies and 8 mollies. See Answer Key for ways to solve the problem and uses with other lessons.

## Daily Maintenance

**Estimation** Which unit would you choose to measure  
 1. your weight? (gram, kilogram) [Kilogram]  
 2. the weight of a pennant? (gram, kilogram) [Gram]  
 3. the width of a ticket? (centimeter, meter) [Centimeter]  
 4. the length of a soccer field? (centimeter, meter) [Meter]  
 5. the length of the program book? (centimeter, meter) [Centimeter]



## Objective 65

Solve problems by choosing addition, subtraction, or multiplication.

### Lesson Theme

Technology: Space

### Materials

- Counters (Punchouts or Math Kit)
- Centimeter Ruler

## Introduction

The Lyndon B. Johnson Space Center is the training headquarters for the United States astronauts. The Mission Control Center at the Space Center controls manned flights from Cape Kennedy. The center also includes the laboratory where scientists examine astronauts and samples of rock and soil after space flights.

**Using Concrete Materials** Have students display a group of 4 counters. Have them display a second group which is 3 times as large as the first group. Ask how many counters are in the second group. [12] Have the students move the counters in the second group to show 3 groups of 4, and point out that 4 counters can be seen 3 times. Have students use a centimeter ruler to draw a line segment 2 cm long. Ask them to draw a line segment which is 3 times as long. Ask students to explain how they did this. [Draw a line segment 6 cm long, draw 3 line segments side by side each 2 cm long] Discuss how multiplication is involved in both of these situations.

## Using the Pages

**Teach** Read the problem and the *Read* step. Ask students how they might solve this problem. [Use a calendar, add, multiply] Review the problem-solving steps. Then work through the problem paying close attention to the *Look Back* step.

**Try** Problem a involves multiplication and Problem b involves addition.

**Apply Problem Solving** Problems 1 and 6 involve addition. Problems 2, 5, and 7 involve subtraction. Problems 3, 4, and 9 involve multiplication. In Problem 9, make sure students understand that "twice as long" means the same as "2 times as long."

**Teaching Tip** If students have difficulty with reading, read each problem aloud and have a student restate it in his/her own words. Ask students if they expect the answer to be greater or less than the numbers in the problem.

### Problem Solving

### Choose the Operation

Marie and Tony visited the Lyndon B. Johnson Space Center in Houston, Texas. They took a walking tour that included the Skylab Mission Building.

In the Skylab Mission Building, Marie learned that the first Skylab Mission lasted 28 days. The third mission lasted 3 times as long as the first. How many days did the third Skylab Mission last?

**Read** Facts: First mission, 28 days  
third mission, 3 times as long  
Find: Number of days for third mission

**Plan** Since the third mission lasted 3 times as many days as the first mission, use multiplication.  
Find  $3 \times 28$ .

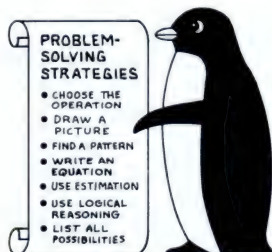
**Solve**

$$\begin{array}{r} 28 \\ \times 3 \\ \hline 84 \end{array}$$

Estimate:  
 $3 \times 30 = 90$

**Answer** The third Skylab Mission lasted 84 days.

**Look Back** The estimate of 90 days is close to 84 days. The answer is reasonable.



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## Practice 65

Name: \_\_\_\_\_ P65

Tell whether you add, subtract, or multiply. Then give the answer.

THE ADMIRAL'S SEAFOOD CAFE MENU			
CLAM CHOWDER	CLAMBURGER ... \$1.10	FISH AND CHIPS	
CUP ..... 55¢	FISHWICH ..... 88¢	SINGLE ..... \$1.34	
BOWL ..... 85¢		DOUBLE ..... \$2.47	

- Sam gave a party at the Admiral's Seafood Cafe. He bought 14 clamburgers. How much did the clamburgers cost?  
Multiply \$15.40
- One afternoon, 17 cups and 24 bowls of chowder were sold. How many orders of chowder were sold in all?  
Add 41 orders
- One kettle of chowder can serve either 87 cups or 56 bowls. How many more cups than bowls can be served?  
Subtract 31 more cups
- One evening, 92 single fish and chips and 57 double fish and chips were sold. How many orders of fish and chips were sold in all?  
Add 149 orders
- Coach Casey bought each member of the team a fishwich after the game. There are 23 players on the team. How much did the fishwiches cost?  
Multiply \$20.24
- One day, 112 orders of fishwich and 86 orders of clamburgers were sold in all. How many more orders of fishwich were sold than clamburgers?  
Subtract 26 more orders

## Reteaching 65

Name: \_\_\_\_\_ R65

The school band practices 3 days each week. They practice 35 minutes each day. How long do they practice each week?

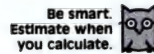
The band practices 105 minutes each week.

Circle the correct operation. Then find the answer.

- There are 42 brass players. Each player sold 7 tickets for the spring concert. Give the total tickets they sold.  
Division 294 tickets
- There are 36 boys and 55 girls in the band. How many people are in the band?  
Addition 91 people
- 23 students tried out to play clarinet. 18 did not get in the band. How many clarinet players are there?  
Subtraction 5 players
- Joan practiced the tuba for 25 minutes each day for 7 days. How many minutes did she practice?  
Multiplication 175 minutes
- The auditorium has 50 rows of seats. Each row has 30 seats. How many seats are there?  
Multiplication 1,500 seats



**Try** Tell whether you *add*, *subtract*, or *multiply*. Then find the answer.



- a. The crew members of the first Skylab Mission ate a total of 9 meals a day. How many meals did they eat in 28 days?  
**Multiply. 252 meals**
- b. The first powered aircraft flight took place in 1903. 58 years later man first flew in space. What year was the first manned space flight?  
**Add. 1961**

**Apply** Tell whether you *add*, *subtract*, or *multiply*. Then find the answer.

1. During the first fifteen years of manned space flights, 34 Soviet cosmonauts and 41 American astronauts were launched into space. How many people traveled in space during those years?  
**Add. 75 people**
3. On the third Skylab Mission, each crew member exercised for 90 minutes each day. How many minutes did each member exercise in 84 days?  
**Multiply. 7,560 minutes**
5. Marie bought a model of an Apollo spacecraft for \$8.75. How much change did she receive from \$10.00?  
**Subtract. \$1.25**
7. Directors of the Skylab Mission had planned for the astronauts to work 565 hours gathering data about the sun. The actual time spent on this was 755 hours. How many more hours than planned were spent gathering data about the sun?  
**Subtract. 190 more hours**
- \*9. The first Skylab Mission lasted 28 days. The second mission was planned to last twice as long. How long was the second Skylab Mission planned to last?  
**Multiply. 56 days**
2. The first Skylab Mission made 405 orbits around the earth. The second mission made 859 orbits. How many fewer orbits did the first mission make?  
**Subtract. 454 fewer orbits**
4. On the Skylab Missions, each astronaut was allowed one shower per week. Only 3 quarts of water were allowed for each shower. How many quarts of water were used for 12 showers?  
**Multiply. 36 quarts**
6. Tony wanted to buy two books about space. One cost \$4.85 and the other cost \$2.95. How much would they cost altogether?  
**Add. \$7.80**
8. Estimation A mid-sized car is about 15 feet long. The space shuttle *Enterprise* is about 8 times this length. Estimate the length of the *Enterprise*.  
**About 120 feet**
10. Write a problem. Write a problem about a space mission for which you can estimate the answer. Then solve the problem.  
**Answers will vary.**

Using Problem-Solving Strategies, page 421  
More Practice Set 65, page 374 **175**

## Assignment Guide

basic	1-8
average	1-8, 10
enriched	1-10

**More Practice Set 65, page 374**

## Follow-Up

**Extra Practice** Have students solve the following problems.

1. Neil is 35 years old. How many months is that? [420 months]
2. Buzz is 35 years old. Sally is 12 years younger than Buzz. How old is Sally? [23 years old]
3. Glenn was 35 years old 12 years ago. How old is Glenn now? [47 years old]

**Enrichment** Write a problem Give students two numbers (two or three digits for the first number and one or two digits for the second number). Have them use those two numbers to make up three problems—one addition, one subtraction, and one multiplication—similar to what was done in the *Extra Practice* above. Students should then exchange papers and solve the problems.

## Reading and Writing Mathematics

Place the following mathematical sentences on the board and have students rewrite each sentence using only words.  $4 + 3 = 7$  [Four plus three equals seven.]  $27 - 9 = 18$  [Twenty-seven minus nine equals eighteen.]  $942 \times 6 = 5,652$  [Nine hundred forty-two times six equals five thousand, six hundred fifty-two.]

## Cooperative Learning Groups

See page 479 of this Teacher's Edition.

## Enrichment 65

Name \_\_\_\_\_ E65

Am I OK, Doctor?

Solve each problem. Use 365 days for 1 year.

1. If you breathe about 950 times in 1 hour, about how many times would you breathe in one day? 22,800 times
2. Sam weighs 47 pounds more than Cindy. Cindy weighs 74 pounds. How much does Sam weigh? 121 lbs.
3. A calorie is a unit of energy. If your body uses about 2,000 calories in 1 day, about how many calories will it use in 1 year? 730,000 calories
4. The average height of an American man is about 71 inches. If Mr. Charles is 5 feet 7 inches tall, how far below the average is his height? 4 inches
5. George's heart normally beats about 70 times per minute. When he runs, his heart beats about 265 times per minute. If he runs for 3 minutes, about how many times will his heart beat in those 3 minutes?  
795 times
6. Your body has 206 bones. There are 29 bones in your head. How many bones do you have that are not in your head? 177 bones
7. If you sleep 8 hours every day, how many hours would you sleep in 2 years?  
5,840 hrs.

## Additional Resource 65

Name \_\_\_\_\_ Additional Resource 65

Mental Math Factors of Ten

There is an easy way to do these exercises. Look for factors that give you 10 or a multiple of 10.

Look for the easy way to multiply mentally.

1.  $5 \times 2 \times 6 =$  60
2.  $2 \times 7 \times 5 =$  70
3.  $5 \times 2 \times 15 =$  150
4.  $2 \times 27 \times 5 =$  270
5.  $5 \times 36 \times 2 =$  360
6.  $2 \times 5 \times 45 =$  450
7.  $5 \times 20 \times 6 =$  600
8.  $5 \times 7 \times 20 =$  700
9.  $20 \times 13 \times 5 =$  1,300
10.  $5 \times 4 \times 5 \times 3 =$  300
11.  $4 \times 25 \times 6 =$  600
12.  $4 \times 25 \times 8 =$  800
13.  $25 \times 18 \times 4 =$  1,800
14.  $4 \times 26 \times 25 =$  2,600
15.  $10 \times 14 \times 10 =$  1,400
16.  $10 \times 36 \times 10 =$  3,600
17.  $2 \times 5 \times 6 \times 10 =$  600
18.  $2 \times 5 \times 4 \times 10 =$  400
19.  $2 \times 6 \times 5 \times 10 =$  600
20.  $2 \times 10 \times 4 \times 5 =$  400

## Daily Maintenance

1.  $6 \times 8$  [48]
2.  $7 \times 7$  [49]
3.  $6 \times 5$  [30]
4.  $8 \times 7$  [56]
5.  $7 \times 9$  [63]
6.  $4 \times 7$  [28]
7.  $8 \times 9$  [72]
8.  $5 \times 9$  [45]

**Using Problem-Solving Strategies, page 421**



## Chapter 6 Test

An acceptable score for each objective is suggested on the Chapter 6 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

Objective	Test items	Text pages
54	1, 2	148–149
55	3–5	150–151
56	6–8	152–153
57	15, 16	154–155
58	9–11	156–157
59	12–14	158–159
60	19–22	162–163
61	17, 18	164–165
62	23, 24	166–167
63	25, 26	168–169
64	27, 28	172–173
65	29, 30	174–175

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
30	100	22	73
29	97	21	70
28	93	20	67
27	90	19	63
26	87	18	60
25	83	17	57
24	80	16	53
23	77	15	50

### Additional Ideas for Evaluation

See pages 464–467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 6 Form for Individualizing
- Cumulative Record Folder

## Chapter 6 Test

Multiply.

$$\begin{array}{r} 1. \ 5 \times 40 \\ 200 \\ 3. \ 63 \\ \times 3 \\ \hline 189 \end{array}$$

$$\begin{array}{r} 5. \ 5,314 \\ \times 2 \\ \hline 10,628 \end{array}$$

$$\begin{array}{r} 7. \ 384 \\ \times 2 \\ \hline 768 \end{array}$$

$$\begin{array}{r} 9. \ 135 \\ \times 5 \\ \hline 675 \end{array}$$

$$\begin{array}{r} 11. \ 2,683 \\ \times 3 \\ \hline 8,049 \end{array}$$

$$\begin{array}{r} 13. \ 4,006 \\ \times 9 \\ \hline 36,054 \end{array}$$

$$\begin{array}{r} 2. \ 29 \times 100 \\ 2,900 \\ 4. \ 802 \\ \times 4 \\ \hline 3,208 \end{array}$$

$$\begin{array}{r} 6. \ 73 \\ \times 6 \\ \hline 438 \end{array}$$

$$\begin{array}{r} 8. \ 6,532 \\ \times 3 \\ \hline 19,596 \end{array}$$

$$\begin{array}{r} 10. \ 324 \\ \times 7 \\ \hline 2,268 \end{array}$$

$$\begin{array}{r} 12. \ 304 \\ \times 8 \\ \hline 2,432 \end{array}$$

$$\begin{array}{r} 14. \ 6,037 \\ \times 4 \\ \hline 24,148 \end{array}$$

Solve each problem. Use these products for the factor 6.

6 12 18 24 30 36 42

15. What pattern is made by the ones digits?

6, 2, 8, 4, 0

16. What pattern is made by the sums of the digits?

6, 3, 9

Estimate each product.

$$\begin{array}{r} 17. \ 6 \times 43 \\ 240 \end{array}$$

$$\begin{array}{r} 18. \ 37 \times 45 \\ 2,000 \end{array}$$

Multiply.

$$19. \ 10 \times 80$$

$$800$$

$$21. \ 70 \times 300$$

$$21,000$$

$$23. \ 84$$

$$\times 30$$

$$2,520$$

$$25. \ 512$$

$$\times 47$$

$$24,064$$

$$27. \ \$0.85$$

$$\times 29$$

$$\$24.65$$

$$20. \ 50 \times 60$$

$$3,000$$

$$22. \ 4 \times 700$$

$$2,800$$

$$24. \ 76$$

$$\times 15$$

$$1,140$$

$$26. \ 907$$

$$\times 62$$

$$56,234$$

$$28. \ \$1.49$$

$$\times 5$$

$$\$7.45$$

Tell whether you *add*, *subtract*, or *multiply*. Then find the answer.

29. A large airplane has 264 passenger seats. How many passengers can the plane carry in 4 trips?

**Multiply. 1,056 passengers**

30. Another airplane can seat 127 passengers. 39 seats are empty. How many passengers are on the plane?

**Subtract. 88 passengers**

## Chapter 6 Letter Home

**Keeping You Posted**

In mathematics, we have been studying multiplication exercises like the ones below. You might continue to review the multiplication flashcards with your child. Also have your child use multiplication to decide how many eating utensils are needed for a party of 40 or more people. We will study geometry next.

To: Family

Multiply. Then follow the answers, in the order given, through the ghost town to the exit. Touch each answer only once.

1. $42 \times 3$ 126	2. $20 \times 40$ 800	3. $247 \times 3$ 741	4. $47 \times 60$ 2,820
5. $72 \times 39$ 2,808	6. $179 \times 4$ 716	7. $185 \times 50$ 9,250	8. $104 \times 70$ 7,280
9. $325 \times 52$ 16,900	10. $78 \times 47$ 3,666	11. $702 \times 68$ 47,736	12. $265 \times 73$ 19,345

## Chapter 6 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name: \_\_\_\_\_

**Posttest Chapter 6**

Multiply.

1. $5 \times 60$	2. $63 \times 100$
3. $72 \times 3$	4. $702 \times 4$
5. $7,142 \times 2$	6. $42 \times 6$
7. $291 \times 2$	8. $7,631 \times 3$
9. $159 \times 5$	10. $332 \times 7$
11. $2,741 \times 3$	12. $409 \times 8$
13. $2,008 \times 9$	14. $4,048 \times 4$

Solve each problem. Use these products for the factor 2.

2 4 6 8 10 12 14 16 18 20 22

15. What pattern is made by the ones digits?

16. What pattern is made by the sums of the digits?

1. 300
2. 6,300
3. 216
4. 2,808
5. 14,284
6. 252
7. 582
8. 22,893
9. 795
10. 2,324
11. 8,223
12. 3,272
13. 18,072
14. 16,192

2, 4, 6, 8, 0, 2  
4, etc.  
2, 4, 6, 8, 1,  
3, 5, 7, 9, etc.

Name: \_\_\_\_\_

**Posttest Chapter 6**  
continued

Estimate each product.

17. $8 \times 51$	18. $77 \times 25$
19. $10 \times 70$	20. $30 \times 80$
21. $40 \times 400$	22. $5 \times 900$
23. $56 \times 40$	24. $32 \times 35$
25. $616 \times 39$	26. $704 \times 67$
27. $\$0.69 \times 35$	28. $\$1.87 \times 5$

Multiply.

19. $10 \times 70$	20. $30 \times 80$
21. $40 \times 400$	22. $5 \times 900$
23. $56 \times 40$	24. $32 \times 35$
25. $616 \times 39$	26. $704 \times 67$
27. $\$0.69 \times 35$	28. $\$1.87 \times 5$

Tell whether you *add*, *subtract*, or *multiply*. Then find the answer.

29. A large airplane has 173 passenger seats. How many passengers can the plane carry in 6 trips?

30. Another airplane can seat 118 passengers. 29 seats are empty. How many passengers are on the plane?

17. 400
18. 2,400
19. 700
20. 2,400
21. 16,000
22. 4,500
23. 2,240
24. 1,120
25. 24,024
26. 47,168
27. \\$24.15
28. \\$9.35
29. Multiply 1,038 passengers
30. Subtract 89 passengers



## Choosing a Computation Method

This page reviews some strategies that have been taught earlier and introduces some new strategies.

Use the examples to discuss when it is possible to estimate an answer and when it is necessary to compute the exact answer. You might also want to talk about other examples like these. When buying groceries, it is often helpful to estimate the total cost before going through the check-out. However, the check-out clerk must find an exact amount for you to pay. Estimates are also made when exact information is not available. For example, if Mrs. Adams thinks she is going to work 29 hours next week, and she earns \$7 an hour, she can estimate that she will earn about  $30 \times \$7$ , or \$210. If she has worked 29 hours and wants to know the amount of her paycheck, she would compute  $29 \times \$7 = \$203$ .

After the students do Problems 1–8 you might want to discuss their responses. Then discuss how the questions for “exact-answer” problems could be changed so an estimate is sufficient and vice versa for “estimate-answer” problems. For example, Problem 4 could be changed like this: “Sam wants a shirt for \$21.50 and a tie for \$13.95. He wonders if he has enough money. About how much would these items cost?” [ $\$22 + \$14 = \$36$ ; About \$36]

Sometimes an estimate is good enough for an answer. Other times an exact answer is needed.

The students in Grades 4, 5, and 6 are planning a boat trip. They can get a boat that holds up to 150 passengers or one that holds up to 300 passengers.

There are 83 people from Grade 4 going on the boat trip, 75 are going from Grade 5, and 78 from Grade 6.

- A.** Estimate to determine which size boat is needed.

$$\begin{array}{r} 83 + 75 + 78 \\ \downarrow \quad \downarrow \quad \downarrow \\ 80 + 80 + 80 = 240 \end{array}$$

The boat for 300 passengers is needed.

- B.** Compute to find the exact number of tickets needed.

$$\begin{array}{r} 83 \\ 75 \\ + 78 \\ \hline 236 \end{array}$$

They need 236 tickets.

For each problem, tell if you would estimate or find an exact answer.

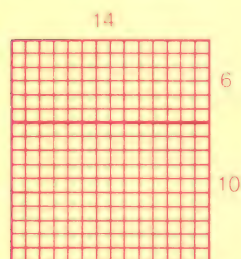
If you find an exact answer, tell if you would use a calculator, paper and pencil, or mental math. Then find the answer. **Method may vary.**

- A map shows that to get from home to Mt. Morris, the Bradys must travel 312 miles, 208 miles, and 406 miles. About how far is it to Mt. Morris?  
**Estimate. About 900 miles**
- Laura has \$10 to spend. Can she buy 3 records that cost \$3.98 each?  
**Estimate. No**
- Tom earns \$1.75 an hour mowing lawns. How much does he earn in 4 hours?  
**Find an exact answer. Calculator \$7.00**
- One car on a train has 84 seats. If 59 people get on that car, how many seats will be empty?  
**Find an exact answer. Paper and pencil 25 seats will be empty**
- Three music classes have 61 students, 56 students, and 49 students. How many song books are needed if each student is to have a book?  
**Find an exact answer. Calculator 166 books needed**
- Sam bought a shirt for \$21.50 and a tie for \$13.95. How much did he pay including \$1.77 tax?  
**Find an exact answer. Paper and pencil \$37.22**
- An airplane flies about 510 miles per hour. About how many miles does it fly in 3 hours?  
**Estimate. About 1,500 miles**
- A restaurant sells about 95 hamburgers each day. Will the 3,000 hamburgers in the freezer be enough for 28 days?  
**Estimate. Yes**

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Answers, page 166

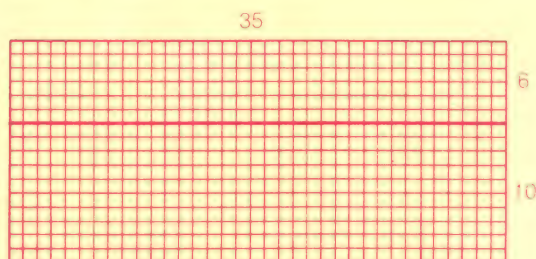
a–c A sample is given.



$$\begin{array}{r} 14 \\ \times 10 \\ \hline 140 \end{array}$$

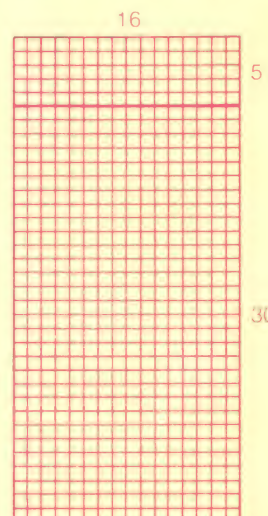
Answers, page 167

22.  $16 \times 35 = (10 + 6) \times 35$



$$\begin{array}{r} 6 \times 35 = 210 \\ 10 \times 35 = 350 \\ \hline 560 \end{array}$$

23.  $35 \times 16 = (30 + 5) \times 16$



$$\begin{array}{r} 5 \times 16 = 80 \\ 30 \times 16 = 480 \\ \hline 560 \end{array}$$

Answers are continued on page 180 of this Teacher's Edition.



## Using Problem-Solving Strategies

- Solve a simpler problem.
- Find a pattern.
- Make a table.

### Introduction

To solve this problem, students will think about the number of digits to be painted if there were fewer houses on the street. By solving easier problems, they will be able to see how to solve the harder one. Students will need some simple knowledge of place value and addition.

### Using the Page

Begin by making sure students understand how Bill is to be paid. Ask how much he will be paid for painting the number 6. [\$1] "How much will he be paid for painting the number 57? [\$2] How much for the number 204?" [\$3]

Problem 1 is a *simpler problem*. Be sure the students notice that the first 9 house numbers will each have 1 digit. Continue by discussing Problem 2.

To answer Problem 3, help the students *find a pattern* by *making a table* on the chalkboard.

House numbers	Number of digits per number	Number of houses	Number of digits to be painted	Total number of digits
1–9	1	9	9	9
10–14	2	5	10	19
15–24	2	10	20	39
25–99	2	75	150	189
100–199	3	100	300	489

Since  $576 - 489 = 87$ , you need 87 more digits. Divide by 3 to find the number of houses. [ $87 \div 3 = 29$ ] Then complete the table to show the house numbers.

House numbers	Number of digits per number	Number of houses	Number of digits to be painted	Total number of digits
200–228	3	29	87	576

[There are 228 houses on the street.]

## Using Problem-Solving Strategies

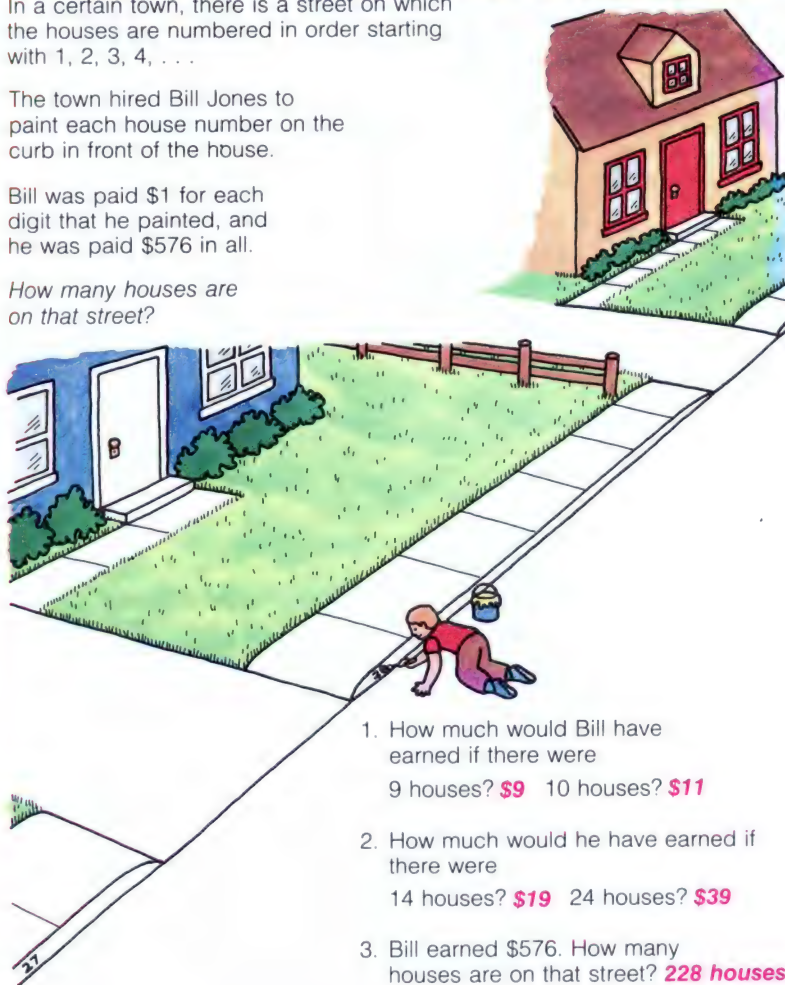
# PAINT BY NUMBER

In a certain town, there is a street on which the houses are numbered in order starting with 1, 2, 3, 4, . . .

The town hired Bill Jones to paint each house number on the curb in front of the house.

Bill was paid \$1 for each digit that he painted, and he was paid \$576 in all.

How many houses are on that street?



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1. How much would Bill have earned if there were 9 houses? **\$9** 10 houses? **\$11**
2. How much would he have earned if there were 14 houses? **\$19** 24 houses? **\$39**
3. Bill earned \$576. How many houses are on that street? **228 houses**

This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 403



## Cumulative Test, Chapters 1–6

Give the letter for the correct answer.

1. Which number sentence is correct?

**C**  
**A**  $45 > 92$     **C**  $28 < 36$   
**B**  $45 < 36$     **D**  $92 < 28$

2. Subtract.

**B**  

$$\begin{array}{r} 10 \\ - 7 \\ \hline \end{array}$$
**A** 4  
**B** 3  
**C** 12  
**D** 17

3. Add.

**C**  

$$\begin{array}{r} 2 \\ 6 \\ 7 \\ + 4 \\ \hline \end{array}$$
**A** 20  
**B** 18  
**C** 19  
**D** 12

4. Tell whether you *add* or *subtract*.  
**B** Solve the problem.

There were 12 books on the shelf.  
 Only 4 books remain. How many  
 books were taken?

**A** Add; 16 books  
**B** Subtract; 8 books  
**C** Subtract; 16 books  
**D** Add; 8 books

5. What does the 2 mean in 6,213?

**C**  
**A** 2 ones    **C** 2 hundreds  
**B** 2 tens    **D** 2 thousands

6. Round 136 to the nearest hundred.

**C**  
**A** 200    **C** 100  
**B** 140    **D** 130

7. Add.

**D**  

$$\begin{array}{r} 868 \\ 492 \\ + 617 \\ \hline \end{array}$$
**A** 1,867  
**B** 1,877  
**C** 1,967  
**D** 1,977

8. Subtract.

**B**  

$$\begin{array}{r} 551 \\ - 378 \\ \hline \end{array}$$
**A** 183  
**B** 173  
**C** 273  
**D** 283

9. What time is  
**A** shown on  
 this clock?



**A** 4:05    **C** 5:05  
**B** 1:20    **D** 1:25

10. Which day of the week is  
**B** November 24?

November						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

**A** Monday    **C** Wednesday  
**B** Tuesday    **D** Thursday

11. Which unit would you use to  
**C** measure the length of your big toe?

**A** Decimeters    **C** Centimeters  
**B** Meters    **D** Kilometers

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## Cumulative Test, Chapters 1–6

The following objectives are covered in this cumulative test. An asterisk preceding the number indicates that the objective is a target objective.

Objective	Test Items	Text pages
*2	1	4–5
*4	2	8–9
*6	3	14–15
*7	4	16–17
*11	5	28–29
*14	6	34–35
*24	7	60–61
*28	8	70–71
*33	9	90–91
*34	10	92–93
36	11	96–97
38	12	100–101
40	13	106–107
50	14	134–135
51	15	136–137
*52	16	138–139
55	17	150–151
*56	18	152–153
*59	19	158–159
60	20	162–163
61	21	164–165
64	22	172–173
65	23	174–175

The chart below can help you determine a percentage score for this test.

Number correct	%	Number correct	%
23	100	17	74
22	96	16	70
21	91	15	65
20	87	14	61
19	83	13	57
18	78	12	52

## Additional Ideas for Evaluation

See pages 464–467.

## Record Forms

- Class Test Record Form
- Student Test Record Form
- Cumulative Record Folder

## Cumulative Test, Chapters 1–6

Cumulative Test  
Chapters 1–6

Circle the letter for the correct answer.

1. Which number sentence is correct?  
**A**  $77 > 53$     **C**  $12 < 37$   
**B**  $37 > 77$     **D**  $12 < 53$

2. Subtract.  

$$\begin{array}{r} 13 \\ - 8 \\ \hline \end{array}$$
**A** 6  
**B** 5  
**C** 7  
**D** 21

3. Add.  

$$\begin{array}{r} 3 \\ 2 \\ 7 \\ + 6 \\ \hline \end{array}$$
**A** 14  
**B** 19  
**C** 18  
**D** 12

4. Tell whether you *add* or *subtract*.  
 Solve the problem.  
 There were 11 books on the shelf. Only 2 books remain.  
 How many books were taken?  
**A** Add; 13 books  
**B** Subtract; 9 books  
**C** Add; 9 books  
**D** Subtract; 13 books

5. What does the 6 mean in 4,625?  
**A** 6 thousands  
**B** 6 tens  
**C** 6 hundreds  
**D** 6 ones

6. Round 245 to the nearest hundred.  
**A** 300    **C** 200  
**B** 250    **D** 240

7. Add.  

$$\begin{array}{r} 484 \\ 324 \\ + 718 \\ \hline \end{array}$$
**A** 1,416  
**B** 1,426  
**C** 1,516  
**D** 1,526

8. Subtract.  

$$\begin{array}{r} 423 \\ - 167 \\ \hline \end{array}$$
**A** 266  
**B** 256  
**C** 356  
**D** 366

9. What time is shown on this clock?  
  
**A** 7:05    **C** 8:05  
**B** 1:35    **D** 1:40

10. What is the date of the second Friday of April?  
  
**A** April 17    **C** April 14  
**B** April 21    **D** April 10

11. Which unit would you use to measure the length of your middle finger?  
**A** Decimeters    **C** Centimeters  
**B** Meters    **D** Kilometers

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Cumulative Test  
Ch. 1–6 (cont'd)

12. Choose the most sensible measure for the amount of liquid in a teacup.  
**A** 300 L    **C** 3 mL  
**B** 3 L    **D** 300 mL

13. Choose the most sensible measure for the length of a pen.  
**A** 5 in.    **C** 5 ft  
**B** 1 in.    **D** 10 ft

14. Multiply.  

$$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$$
**A** 28  
**B** 35  
**C** 12  
**D** 32

15. Multiply.  

$$\begin{array}{r} 8 \\ \times 8 \\ \hline \end{array}$$
**A** 16  
**B** 72  
**C** 56  
**D** 64

16. Multiply.  

$$\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$$
**A** 32  
**B** 44  
**C** 36  
**D** 38

17. Multiply.  

$$\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array}$$
**A** 86  
**B** 45  
**C** 75  
**D** 85

18. Multiply.  

$$\begin{array}{r} 64 \\ \times 3 \\ \hline \end{array}$$
**A** 182  
**B** 108  
**C** 118  
**D** 192

19. Multiply.  

$$\begin{array}{r} 705 \\ \times 6 \\ \hline \end{array}$$
**A** 4,500  
**B** 450  
**C** 4,230  
**D** 711

20. Multiply.  

$$50 \times 700$$
**A** 350  
**B** 35,000  
**C** 3,500  
**D** 350,000

21. Estimate the product.  

$$53 \times 66$$
**A** 3,500  
**B** 350  
**C** 3,000  
**D** 300

22. Multiply.  

$$\begin{array}{r} \$1.42 \\ \times 4 \\ \hline \end{array}$$
**A** \$4.68  
**B** \$4.78  
**C** \$5.78  
**D** \$5.68

23. Tell whether you *add*, *subtract*, or *multiply*. Solve the problem.  
 A large airplane has 285 passenger seats. How many passengers can the plane carry in 5 trips?  
**A** Multiply; 1,045 passengers  
**B** Multiply; 1,425 passengers  
**C** Add; 290 passengers  
**D** Subtract; 290 passengers



# Cumulative Test, Chapters 1-6 continued

12. Choose the most sensible measure  
D for the amount of liquid in a raindrop.

A 200 L      C 2 L  
B 200 mL      D 2 mL

13. Choose the most sensible measure  
A for the length of a worm.

A 8 in.      C 8 ft.  
B 80 in.      D 80 ft.

14. Multiply.

B 
$$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$
      A 45  
B 49  
C 52  
D 56

15. Multiply.

D 
$$\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$$
      A 12  
B 28  
C 34  
D 32

16. Multiply.

C 
$$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$$
      A 45  
B 15  
C 54  
D 38

17. Multiply.

A 
$$\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$$
      A 96  
B 35  
C 85  
D 95

18. Multiply.

D 
$$\begin{array}{r} 56 \\ \times 2 \\ \hline \end{array}$$
      A 102  
B 187  
C 197  
D 112

19. Multiply.

C 
$$\begin{array}{r} 406 \\ \times 4 \\ \hline \end{array}$$
      A 1,804  
B 184  
C 1,624  
D 410

20. Multiply.

B  $50 \times 800$       A 400  
B 40,000  
C 4,000  
D 400,000

21. Estimate the product.

A  $42 \times 56$   
A 2,400      C 2,000  
B 240      D 200

22. Multiply.

D 
$$\begin{array}{r} \$2.16 \\ \times 3 \\ \hline \end{array}$$
      A \$4.38  
B \$7.38  
C \$7.48  
D \$6.48

23. Tell whether you *add*, *subtract*, or  
A *multiply*. Solve the problem.

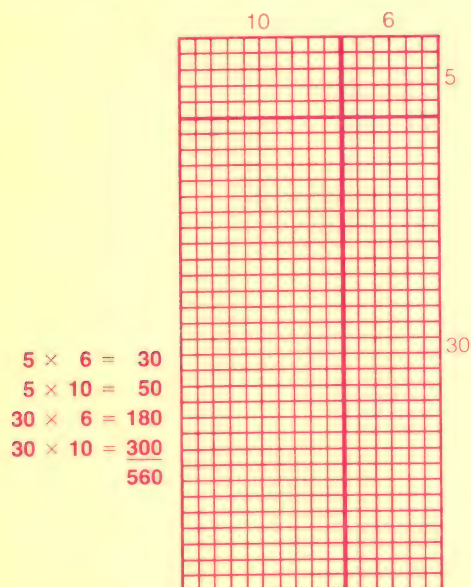
A large airplane has 252 passenger seats. How many passengers can the plane carry in 6 trips?

A Multiply; 1,512 passengers  
B Multiply; 1,212 passengers  
C Add; 258 passengers  
D Subtract; 246 passengers

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Answers, page 167

24.  $35 \times 16 = (30 + 5) \times (10 + 6)$



25. 182 squares

$13 \times 14 = (10 + 3) \times (10 + 4)$

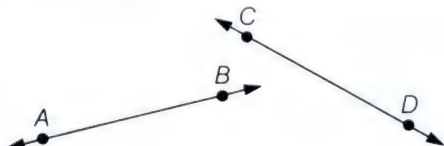
30. Find 16 times the  
product of 2 and 50.



## Mathematical Background

**Basic Geometric Concepts** There are many models for lines. When a plane flies from Chicago to Tokyo, for example, it doesn't follow a "straight" line—the kind discussed in a geometry unit. It would more likely fly along longitude lines that follow the curvature of the earth.

Lines and rays are endless, but in the text they can only be shown as a *part* of a line. Lines in a plane can either intersect or not. If two lines do not intersect, they must be parallel. In the drawing below, the lines do not intersect; however, if *extended*, the lines *do* intersect.



Similarly, the measure of an angle depends on the amount of rotation from one ray to the other, not on the length of the rays. In the following figure the two angles are congruent (they have the same measure) despite one looking "larger" than the other.



**Polygons** Other than triangles and quadrilaterals, the names of polygons are derived from Greek prefixes. The more common ones are *penta-* (5), *hexa-* (6), *octa-* (8), and *deca-* (10); thus a polygon with 10 sides would be called a decagon. This principle is eventually extended to solids. An octahedron would be a solid with 8 faces.

## Perimeters, Areas, and Volumes

The perimeter of a geometric figure (for a circle, a circumference) is measured in linear units, such as inches. (Thus the perimeter of a rectangle could be 24 inches.) Area is the measure of a region and should be stated in square units. Volume is a measure of space and should be stated in cubic units.

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## Pretest for Chapter 7

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 7**

1. Name the segment. Segment CD or DC

2. Are the lines parallel or intersecting? Parallel

3. Name the angle. Angle EFG or GFE

For Exercises 4–10, answer the question by writing yes or no.

4. Is this angle a right angle? Yes

5. Is this figure a polygon? Yes

6. Are these segments congruent? No

7. Are these polygons congruent? Yes

8. Is this polygon a rectangle? No

9. Is this polygon a square? No

10. Is the broken line a line of symmetry? Yes

13

Name \_\_\_\_\_

**Pretest Chapter 7**

Find the perimeter of each figure.

11. 11 cm

12. 25 cm

Find the area of each figure in square centimeters.

13. 4 square centimeters

14. 5 square centimeters

15. 8 square centimeters

Use the circle for Exercises 16–18.

16. Name the center. Point D

17. Name a radius. Segments CD, ED, or FD

18. Name a diameter. Segment CE or EC

19. Is the figure a sphere, cone, or cylinder? Sphere

20. Find the volume of this figure in cubic centimeters. 6 cubic centimeters

14



# Teaching Chapter 7



## Problem Solving

**Problem-Solving Strategies** In this chapter, students acquire some in-depth practice at solving problems by getting information from pictures and using the strategy *Draw a picture*. The nonroutine problems in the *Using Problem-Solving Strategies* features on pages 196–197, 210, 422, and 423 involve the strategies *Find a pattern* and *Try and check*.

When students work on nonroutine problems, their method of solution is as important as the correct answer. Students' solutions should be judged both on whether they fit the conditions of the problem and on whether they lead to a correct answer. If you grade their work, it is a good idea to give students one grade for the method of solution and a second grade for the correctness of the answers.



## Calculators and Computers

**Calculators** In this chapter, students use calculators to solve problems involving perimeter and volume. Some students might have difficulty “translating” the two-dimensional drawing into a three-dimensional shape. You could help such students by providing building blocks. Manipulating the blocks, students should be able to visualize the problem and successfully complete **Additional Resources 76 and 77**.

**Computers** Students are introduced to some simple Logo commands (FD, BK, RT, LT, REPEAT). Before your students complete the exercises on page 197, you may want to have them “play turtle” by walking out a series of commands. For example, pairs of students could take turns directing each other to given locations, using FD (number), BK (number), RT 90, and LT 90 commands. They may need to be helped to see that FD 10 means “10 steps forward,” and that RT 90 means “turn to the right 90 degrees,” or a fourth of a complete rotation.

If you plan to use **Additional Resources 66 and 69** on the computer, you will need Logo software. Logo commands vary slightly, from one software package to another. Make sure you check the manual for your software adjustments before you begin.

In **Additional Resource 71**, students are introduced to a decision diamond in a flow chart, as a readiness activity for loops in a computer program.



## Concrete Materials

The use of concrete materials is very important in the study of geometry. Students can look for geometric shapes and other concepts in everything around them. Have students draw or bring in pictures of objects to be put on a bulletin board. Then, as the class studies various geometric concepts, let them label the pictures with the proper attributes, such as shape, size, number of angles, lines of symmetry, area, perimeter, volume, and so on.

Tessellation patterns can be fascinating for many students. As they study various polygons, have students trace a given polygon several times, making sure that one side always touches a side of the previously traced polygon. Lead students to discover that some polygons can be used to tile (tessellate) a flat surface. This means that when the polygons are placed side by side, they do not overlap, and there are no gaps. Some polygons that will tessellate are triangles, rectangles, and hexagons. Let students draw designs, using a tessellating pattern.



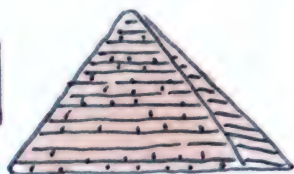
The study of Logo can reinforce geometric ideas.



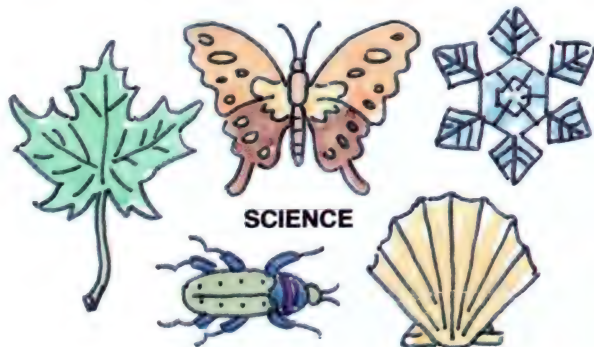


## Thinking Skills

In this chapter, students recall factual knowledge as they learn geometric terms. They work on comprehending concepts and applying concepts as they use the ideas of congruence, perimeter, area, volume, and symmetry. They also learn to follow rules and procedures when they find area and volume by counting and when they check for symmetry by tracing and folding. The *Using Problem-Solving Strategies* feature on page 423 helps them analyze relationships involving perimeter and area. On pages 196–197, students find a pattern for deciding whether a point is inside or outside a closed curve. On page 210, students make generalizations when they find a pattern. Throughout the chapter, the activities with concrete materials in the lesson notes encourage higher order thinking skills.



### SOCIAL STUDIES



### SCIENCE

It is important that students see the use of mathematics in everyday life. One way to do this is to relate it to other school subjects.



## Teaching Techniques

**Questioning and Responding** When teaching geometry, it is important not to rely on just verbal questions and answers to assess whether students understand. As much as possible, communicate using actual objects or drawings, and ask students to explain their answer, so you can be sure they understand the concepts behind the terms.

After a student answers a question, try to respond in an accepting way even if the answer is wrong. Avoid showing disappointment or sounding judgmental. Instead ask for clarification or an explanation as to how the answer was obtained. Praise the student for thinking and trying, so that the student won't be discouraged.

**Helping Students Read and Write Mathematics** When students read a chapter on geometry, it's important for them to learn to interpret two-dimensional drawings of three-dimensional figures. You might point out that perspective drawings shorten segments to show depth; so in a drawing of a cube, not all edges are the same length. When students draw geometric figures on paper, encourage them to make the drawings good-sized (not too small) and to use a ruler when appropriate.

**Teaching Students with Special Needs** When teaching geometry to students with limited English proficiency, be sure to establish a conceptual base for all new vocabulary that is introduced. Then ask the students questions that give them an opportunity to demonstrate whether they understand. Low achievers and special-education students may need help with spatial visualization. Learning disabled students may need to finger-trace geometric figures, hold geometric solids, and get extra help distinguishing one shape from another.

Gifted students can benefit from geometry projects. Stimulating projects include: have them collect pictures of buildings, food, furniture, leaves, and so on, and identify the shapes, angles, parallel lines, and other geometric concepts. Have them develop star polygons like those in **Enrichment 74**. After they have created several, help them identify general rules for star polygons. In addition, have students who have access to a computer, use the graphics program to develop their own geometric designs.

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

Art: making models (194–195), bulletin board (198–199)

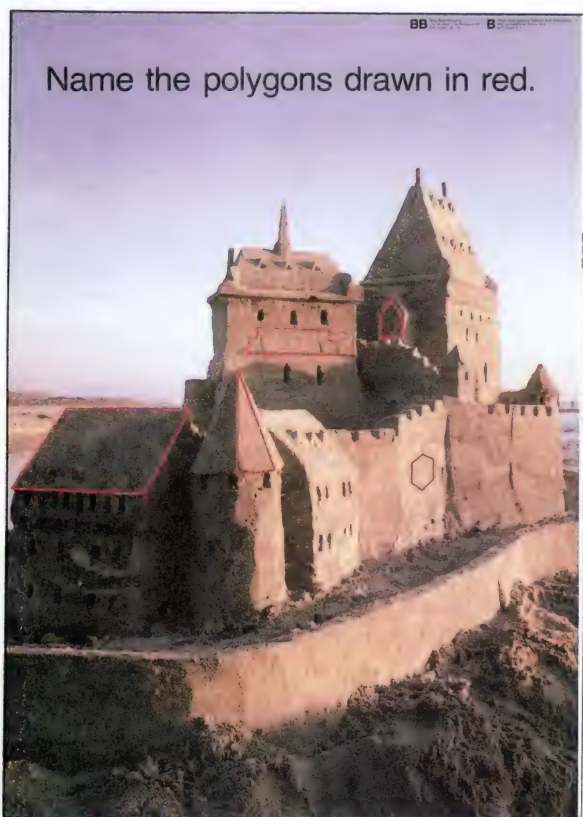
Science: nature (202–203)

Social Studies: road signs (186–187), monuments (192–193)

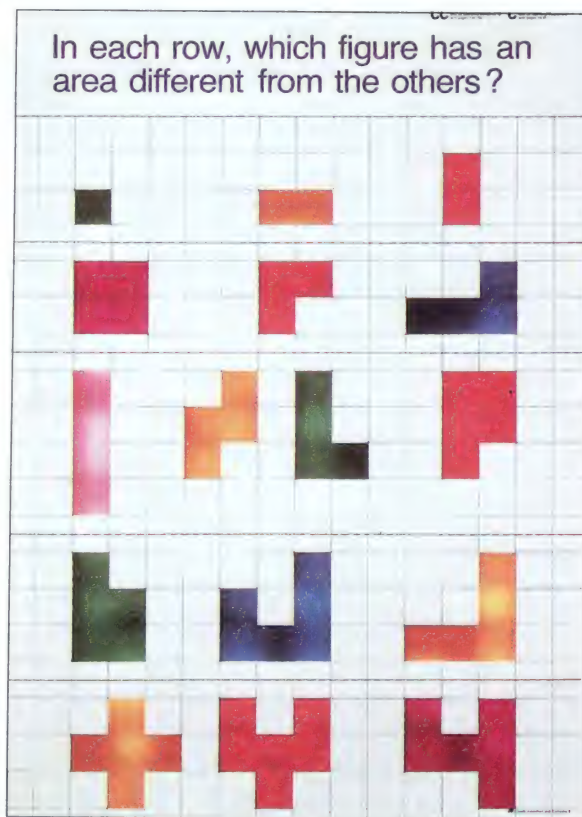


## Bulletin Board Suggestions

The posters shown here can be used with Chapter 7. Please note that although Math Poster DD is not shown here, it can also be used with this chapter. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster BB



Math Poster CC



Math Poster EE

## Materials Chapter 7

- String 182–183, 200–201
- Road maps 182–183
- Newspapers 182–183
- Magazines 182–183
- Index cards 184–185
- Calculator 184–185, 206–207
- Geoboards (Math Kit) 186–187, 190–191
- Rubber bands (Math Kit) 186–187, 190–191
- Pattern blocks (Math Kit) 186–187, 202–203
- Tracing paper 188–189, 202–203
- Dot paper (Teaching Aid J) 188–191
- Tangrams (Math Kit) 188–189
- Centimeter grid (Teaching Aid K) 190–191, 194–195, 198–199, 204–205
- Rulers (Teaching Aid F, Punchouts, or Math Kit) 192–193, 196–197
- Counters (Punchouts) 194–195
- Crayons, colored pencils, or markers 198–199
- Fraction models (Punchouts) 200–201
- Compass 200–201
- Circular objects 200–201
- Centimeter rulers (Teaching Aid G, Punchouts, or Math Kit) 200–201
- Scissors 202–203
- 3-dimensional shapes (Math Kit) 204–205
- Patterns: cube and rectangular prism (Punchouts) 204–207
- Cubic centimeter blocks 206–207
- Several small boxes 206–207
- Graph paper 210



### Basic Situation

Use the picture on this page to generate a discussion about the shapes of foods. Have students name some of the foods that they have seen at home, in grocery stores, or in magazine pictures that have common shapes. Ask students to explore the range of geometric shapes that foods have.

### Possible Problems

- What foods come naturally in geometric shapes like carrots (cones) or oranges (spheres)?
- What foods are made into geometric shapes like pizzas (circles)?
- What foods are packaged in geometric shapes like soup (cylinders) or cereal (rectangular prisms)?

### Indicators of Success

Students might discuss how information will be collected. Should each student gather data for a different type of food shape or should each search for all types?

Students might decide how to display their findings. Should they collect samples of foods or pictures of food or make drawings of food?

How should they organize their findings? Should they use bulletin boards, or picture books, or compile a dictionary of results?

### Ways to Help

Students may not know the names of some of the shapes. You might have them make a list of names of shapes and add to the list as they go through the chapter.

You might encourage students to identify some examples of geometric shapes that can be found in the classroom and can serve as models during their search. They may wish to bring in objects or pictures of objects that are shapes that are not found in the classroom.













Students may name foods that do not have a geometric shape with a common name. They can discuss whether to include these. If included, they could describe some of the geometric properties of the food or its container. (A paper cup is a truncated cone called a frustum; an oval cracker is called an ellipse; an elongated grape, an ellipsoid.)



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

### Possible Results

Here are sample pages of reports from different groups of students.

Cones	Crackers	Shapes of foods
Ice cream cones 	Square 	Pea  sphere
Carrot 	Rectangle 	Melon  sphere
Yogurt 	Hexagon 	Radish red  sphere
	Circle 	white  almost a cone
		Sandwich rectangular prism or other shapes 



## Objective 66

Identify parallel and intersecting lines and give the names of segments.

### Lesson Theme

Consumer Topics: Bus Routes

### Vocabulary

Intersecting lines, line, parallel lines, point, segment

### Materials

- String
- Road maps
- Newspapers
- Magazines

### Introduction

Discuss phenomena that extend indefinitely and seem to depict lines. One seemingly endless set of railroad tracks would be an example that students may have seen. As a further demonstration, place two thumbtacks about 2 feet apart on the bulletin board. Show the students a long piece of string. Ask them to imagine that the string extends indefinitely. Place the string across the thumbtacks so that a segment is formed.

### Using the Pages

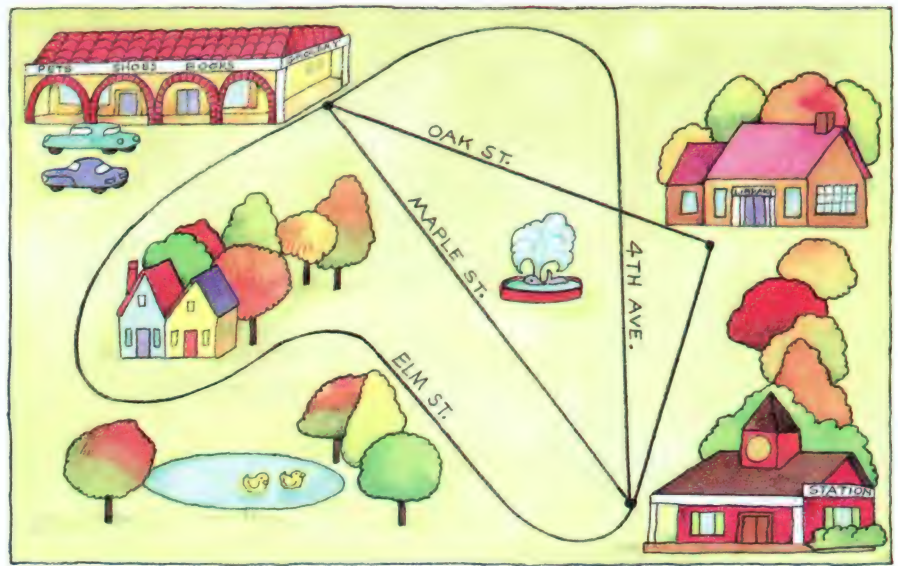
**Teach** Ask students how many endpoints a segment has [2] and have them explain their answer. [A segment has a starting point and an ending point.] Ask them how many endpoints a line has [0] and have them explain their answer. [A line goes on and on without a starting point or an ending point.] Point out that segment  $AB$  is the same as segment  $BA$ .

**Try Error Analysis** Watch for students who have difficulty understanding Exercise f. Have these students trace the two lines as shown on a piece of paper. Remind them that lines go on and on and have them extend both lines until they can see a point of intersection. Supply additional examples of pairs of lines that will intersect when each line is extended. Students may want to extend the drawings of two parallel lines and discuss their findings. (See Reteaching 66.)

**Practice** In Exercises 1–3, students should include the words *line* or *segment* in their answers.

**Apply Problem Solving** Be sure students understand that each picture demonstrates or suggests a geometric shape.

## Points, Lines, and Segments



- A. A city bus schedule shows these four routes from the shopping mall to the train station. What is the shortest route? Maple Street is a straight path. It is the shortest route.

The straight path from **point A** to **point B** is **segment AB**. This picture shows segment  $AB$ .



- B. A segment is a part of a **line**. A line goes on and on, in both directions. This picture shows line  $CD$ .



Lines  $KL$  and  $MN$  are **intersecting lines**.



Lines  $WX$  and  $YZ$  are **parallel lines**.



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## Practice 66

Name \_\_\_\_\_

Who am I? About 300 a.c. I organized nearly all of the mathematics known at that time into thirteen books.

To find my name, draw the following segments, using the points below.

1. GT	2. DR	3. FE	4. JL	5. IY	6. AB
7. WZ	8. IZ	9. ML	10. EP	11. NC	12. UT
13. PS	14. YW	15. JK	16. XH	17. AJ	18. NR

For each of the following, circle the word to indicate the correct description for each pair of lines.

19.	20.	21.
Parallel	Intersecting	Parallel
Intersecting	Parallel	Intersecting
22.	23.	24.
Parallel	Intersecting	Parallel
Intersecting	Parallel	Intersecting

## Reteaching 66

Name \_\_\_\_\_

A **segment** is part of a line. A segment has endpoints.

A **line** goes on and on in both directions.

**Intersecting lines** cross at some point. Notice the point where line  $EF$  and line  $GH$  cross.

**Parallel lines** are lines that never cross. The distance between the lines never changes.

Tell whether each figure is a segment or a line.

1.	Segment	2.	Line
3.	Line	4.	Segment

Name each segment or line.

5.	6.	7.
Line PQ	Segment XY	Line VW

Tell whether the lines are parallel or intersecting.

8.	9.	10.
Intersecting	Parallel	Intersecting
11.	12.	
Intersecting	Parallel	



**Try** Name each segment or line.



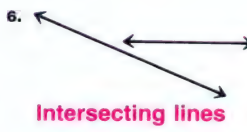
For each exercise, tell whether the lines are intersecting lines or parallel lines. Remember that lines go on and on.



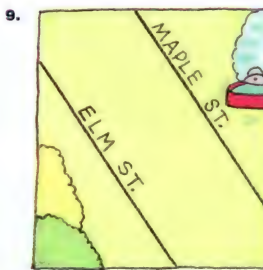
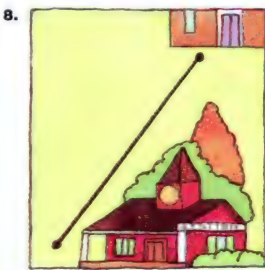
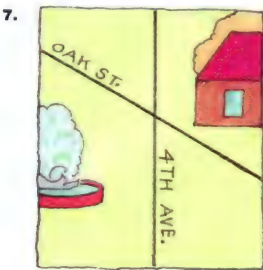
**Practice** Name each segment or line.



For each exercise, tell whether the lines are intersecting lines or parallel lines.



**Apply** Tell whether each picture suggests a segment, intersecting lines, or parallel lines. **See margin.**



More Practice Set 66, page 375 **183**

## Assignment Guide

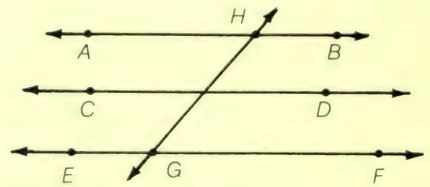
basic	1-9
average	1-9
enriched	1-9

**More Practice Set 66, page 375**

## Follow-Up

**Extra Practice** In the following figure, have the students name each

1. line. [AB, CD, EF, GH]
2. pair of intersecting lines. [AB and GH, CD and GH, EF and GH]
3. set of parallel lines. [AB, CD, EF]
4. point. [A, B, C, D, E, F, G, H]



## Reteaching Using Concrete Materials

Have students point out the many examples of parallel and intersecting lines in the classroom.

Have students examine road maps of their town or state. Have them find examples of segments, intersecting lines and parallel lines.

**Enrichment** Have students bring to school pictures they have cut out of magazines or newspapers that suggest the concepts taught in the lesson. Students can make up a bulletin board in the classroom or a scrapbook using the pictures.

## Enrichment 66

Parallel Lines **E66**

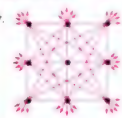
Connect dots to draw as many lines as you can that are parallel to the given line. Use a straightedge. Give the total number of lines.

1. number of parallel lines **5**
2. Number of parallel lines **5**
3. Number of parallel lines **7**
4. Number of parallel lines **9**
5. Number of parallel lines **8**
6. Number of parallel lines **9**

Connect dots to draw as many lines as you can on the dot array below. Make lines that are parallel to each other the same color.

8. How many lines could you draw? **20**

9. How many colors did you need? **8**



## Additional Resource 66

Additional Resource **66**

**Computer** Logo: Drawing Lines

In Logo, the Turtle is a small triangle that can move on the computer screen.

Here are some commands to the Turtle.

Command	Short name	What the Turtle does
FORWARD 40	FD 40	Goes forward 40 steps
BACK 60	BK 60	Goes backward 60 steps
RIGHT 90	RT 90	Turns right 90 Turtle turns
LEFT 60	LT 60	Turns left 60 Turtle turns
PENUP	PU	Lifts the "pen" up
PENDOWN	PD	Puts the "pen" down
CLEARSCREEN	CS or DRAW	Goes home; the screen is cleared.

Type these instructions.

```
CS PD 40
RT 90 PU FD 10
RT 90 PD FD 40
LT 90 PU FD 10
LT 90 PD FD 40
```

1. Are the lines vertical or horizontal? **Vertical**

2. Are they parallel or intersecting? **Parallel**

3. Write instructions to draw another parallel line. Answers will vary. Sample answer is given.

```
RT 90 PU FD 10
RT 90 PD FD 40
```

4. Add instructions to draw 3 parallel horizontal lines. Answers will vary. Sample answer is given.

```
CS LT 90 PD 50
RT 90 PU FD 10 RT 90 PD FD 50
LT 90 PU FD 10 LT 90 PD FD 50
```

## Daily Maintenance

### Choosing a computation method

Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

1.  $3 \times 807$  [2,421]
2.  $4 \times 230$  [920]
3.  $9 \times 600$  [5,400]
4.  $7 \times 5,016$  [35,112]
5.  $6 \times 1,109$  [6,654]
6.  $5 \times 1,061$  [5,305]

**Answers, page 183**

**7. Intersecting lines**

**8. Segment**

**9. Parallel lines**



## Objective 67

Identify right angles and give the names of angles.

### Lesson Theme

Consumer Topics: Clothing

### Vocabulary

Angle, ray, right angle

### Materials

- Index cards
- Grid paper (Teaching Aid K)

### Introduction

Review the fact that lines continue on indefinitely. Introduce a ray as a part of a line that has an endpoint and goes on and on in one direction. You may wish to use a flashlight beam as a physical example of a ray.

**Using Concrete Materials** Give each student a piece of paper with a right angle drawn on it. Have each student use the square corner of an index card to check that the angle is a right angle. Have the students extend the sides of the angle and check it with an index card. Ask them if the angle is still a right angle. [Yes]

### Using the Pages

**Teach** Read and discuss each example. Ask students to point out things in the classroom that form angles. Stress that the lengths of the sides have nothing to do with the size of the angle. Show students how to use an index card to check for right angles.

**Try** In Exercise a, point out that the corner (or vertex) of the angle is always the second letter in a three-letter angle name.

**Practice Error Analysis** In Exercises 2, 10, and 13, watch for students who do not recognize right angles shown in different positions. Explain that the position of the angle has nothing to do with the size of the angle. These students may find it easier to recognize right angles if they turn their books.

In Exercises 4–7, students are asked to see if a figure can be constructed according to a given condition about its angles. You might want to ask, "Can a 3-sided figure have two right angles?" [No] Explain. [Two of the sides would be parallel.]

### Apply Problem Solving

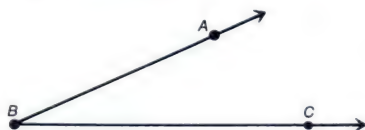
**List all possibilities** In Problems 15 and 16 some students may assign letters to each corner of the objects and then list each right angle by name.

## Angles

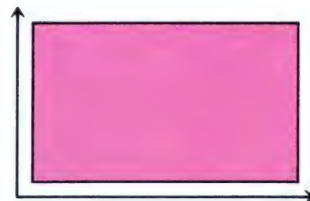


- a.** A **ray** is part of a line that goes on and on in one direction. When two rays have the same endpoint, they form an **angle**.

This angle is called angle  $ABC$  or angle  $CBA$ .



- b.** An angle that forms a square corner is called a **right angle**. You can test for right angles by using the square corner of a card.



### Try

- a.** Give two names for this angle.



Angle  $XYZ$ , Angle  $ZYX$

- b.** Is this angle a right angle? Use a card to help you decide. Write yes or no.



Yes

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## Practice 67

Is the angle a right angle? Write yes or no.

- Yes
- No
- Yes
- No
- Yes
- No
- No
- No
- Yes

Give two names for each angle.

- $\angle WON$
- $\angle NED$
- $\angle PAM$
- $\angle NOW$
- $\angle DEN$
- $\angle MAP$
- $\angle NOT$
- $\angle GOT$
- $\angle SAG$
- $\angle TON$
- $\angle TOG$
- $\angle GAS$

## Reteaching 67

The angle at point D can be named in two ways.

angle  $EDC$  or angle  $CDE$

D is the middle letter.

Give two names for each angle.

- Angle  $CBA$
- Angle  $MPR$
- Angle  $WCX$
- Angle  $HFG$
- Angle  $XCW$
- Angle  $RPM$
- Angle  $GPH$
- Angle  $FHG$
- Angle  $GPH$
- Angle  $GPH$
- Angle  $GPH$
- Angle  $GPH$

Each of these angles forms a square corner. They are right angles.

Circle each right angle. Use a card to help you decide.

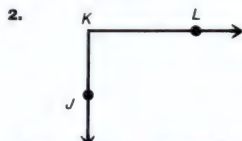
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle
- Right angle



**Practice** Give two names for each angle.



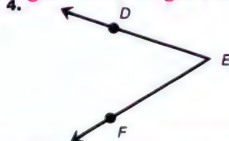
Angle MNP, Angle PNM



Angle JKL, Angle LKJ



Angle STU, Angle UTS



Angle DEF, Angle FED



Angle UVW, Angle WVU



Angle LMK, Angle KML

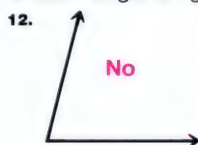
On grid paper, draw an example of a 4-sided figure with

See margin.

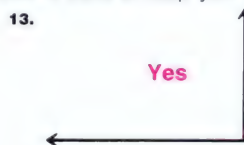
7. no right angles.    8. only 2 right angles.    9. exactly 3 right angles.    10. 4 right angles.

11. Could you draw all of the shapes in Exercises 7–10? Explain. **No. See margin.**  
Work in groups. Compare your drawings with other students' drawings.  
Take turns explaining how you made each drawing.

Is each angle a right angle? Use a card to help you decide. Write yes or no.



No



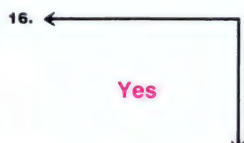
Yes



No



Yes

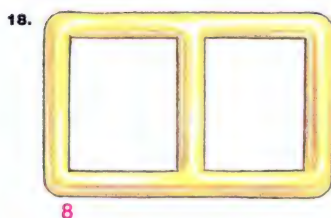


Yes

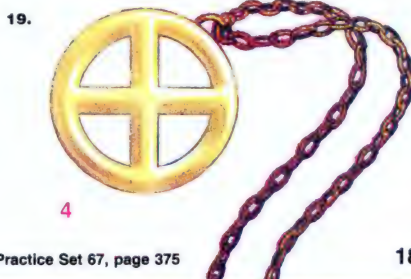


No

**Apply** How many right angles are in each object?



8



4

More Practice Set 67, page 375

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## Assignment Guide

basic 1–17, 19  
average 1–17, 19  
enriched 1–19

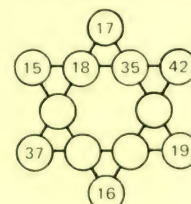
More Practice Set 67,  
page 375

## Follow-Up

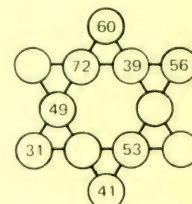
**Enrichment** Have students list times of the day when the hands of the clock appear to form right angles. [3:00, 4:05, 9:00] For this activity, they can ignore the fact that at times the angle is slightly more or less than a right angle.

## Calculator

Each row of four numbers has the same sum. Have students find the missing numbers.



[clockwise 39,  
13, 41, 38]



[clockwise 62,  
51, 77, 45]

## Daily Maintenance

Tell whether you should add, subtract, or multiply. Then solve the problem.

- In 1861, the cost of sending mail by Pony Express was \$32 per pound. How much money was collected for 18 pounds of mail? [Multiply, \$576]
- In 1776, there were 28 post offices in the United States. By 1795, there were 425 more. How many post offices were there in 1795? [Add, 453 post offices]

## Enrichment 67

When Lines Intersect You Get ...

3 different lines can have 0, 1, 2, or 3 points of intersection.

0 points of intersection.  
0 angles formed.

1 point of intersection.  
6 angles formed at that point.

2 points of intersection.  
4 angles formed at each point.

3 points of intersection.  
4 angles formed at each point.

For each exercise, draw 4 lines with the given number of intersection points. Then give the number of angles that are formed at each point.

1. 0 points of intersection.  
0 angles formed.

2. 1 point of intersection.  
8 angles formed.

3. 4 points of intersection.  
4 angles formed at each.

4. 6 points of intersection.  
4 angles formed at each.

## Additional Resource 67

Maintenance

Add, subtract, or multiply

1. $5 \div 4 = 20$	2. $5 \div 4 = 9$	3. $5 - 4 = 1$
4. $9 \div 6 = 54$	5. $9 \div 6 = 15$	6. $9 - 6 = 3$
7. $14 - 5 = 9$	8. $8 \div 8 = 16$	9. $8 \div 6 = 48$
10. $9 \div 9 = 81$	11. $9 \div 8 = 17$	12. $6 \div 6 = 36$
13. $7 \times 0 = 0$	14. $7 \div 0 = 7$	15. $7 - 0 = 7$
16. $17 - 9 = 8$	17. $7 \times 7 = 49$	18. $9 \div 9 = 18$
19. $6 \times 8 = 48$	20. $13 - 8 = 5$	21. $7 \times 8 = 56$
22. $3 \times 7 = 21$	23. $6 \times 9 = 54$	24. $11 - 7 = 4$
25. $2 \times 9 = 18$	26. $3 \times 9 = 12$	27. $5 \div 5 = 10$
28. $15 - 9 = 6$	29. $7 \times 6 = 42$	30. $7 \div 6 = 13$
31. $0 \div 8 = 0$	32. $9 - 9 = 0$	33. $12 \div 6 = 6$
34. $15 - 8 = 7$	35. $5 \times 5 = 25$	36. $8 \times 7 = 56$
37. $7 \div 9 = 63$	38. $6 \div 6 = 12$	39. $8 \times 8 = 64$

Answers, page 185

Answers will vary. A sample is given.



6. not possible



8. No. The lines on grid paper meet at right angles. When drawing a 4-sided figure with exactly 3 right angles, the lines forming the sides of the fourth angle will lie on the grid lines which make the fourth angle a right angle.



## Objective 68

Identify polygons and give the numbers of sides and angles in polygons.

### Lesson Theme

Social Studies: Road Signs

### Vocabulary

Hexagon, octagon, pentagon, polygon, quadrilateral, triangle

### Materials

- Geoboards (Math Kit)
- Rubber Bands (Math Kit)
- Pattern Blocks (Math Kit)

## Introduction

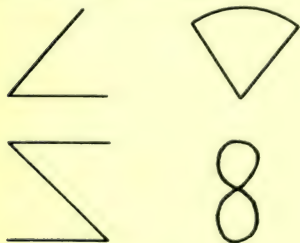
**Using Concrete Materials** Using rubber bands and geoboards, have students form polygons with 3, 4, 5, 6, and 8 sides. Have students compare the number of sides to the number of angles in each polygon. Have them name each polygon.

## Using the Pages

### Teach Reading and Writing Mathematics

Discuss each kind of polygon. Explain that the prefix *tri* means three and that a triangle has three sides and three angles. Explain in a similar way *quad* for four, *penta* for five, *hexa* for six, and *octa* for eight.

**Try Error Analysis** Be sure students understand that Exercise a is not a polygon because it is not a closed figure made up entirely of segments. Provide other examples of figures that are not polygons such as those shown below and have students explain why they are not polygons.



(See Reteaching 68.)

**Practice** Exercise 2 is not a polygon because it is not a closed figure. Exercise 3 is not a polygon because it is not made up of line segments.

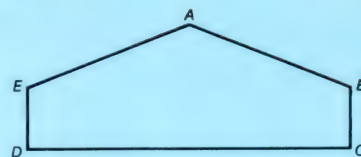
**Apply Problem Solving** Students may work in groups to solve these problems.

**Use physical models** Have students give other examples of road signs whose shapes are polygons. [Pentagon—school; diamond—warning; triangle—no passing]

## Polygons

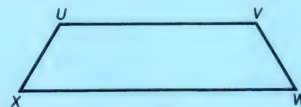
The shape suggested by each road sign below is a **polygon**. The sides of a polygon are segments. The sides meet to form angles.

This polygon has 5 sides and 5 angles. The names of the sides are *AB*, *BC*, *CD*, *DE*, and *EA*. The names of the angles are *ABC*, *BCD*, *CDE*, *DEA*, and *EAB*.

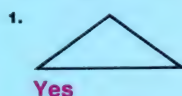


### Try

- Tell whether this figure is a polygon. Write *yes* or *no*.
- Name the sides and angles of this polygon.



**Practice** Tell whether each figure is a polygon. Write *yes* or *no*.



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## Practice 68

Complete the table				
Polygon	Number of sides	Number of angles	Names of sides	Names of angles
1.  Octagon	8	8	Sides AB, BC, CD, DE, EF, FG, GH, HA	Angles ABC, BCD, CDE, DEF, EFG, FGH, GHA, HAB
2.  Hexagon	6	6	Sides PQ, QR, RS, ST, TU, UP	Angles PQR, QRS, RST, STU, TUP, UPQ
3.  Triangle	3	3	Sides MN, NL, LM	Angles LMN, MNL, NLM
4.  Quadrilateral	4	4	Sides KL, LM, MN, NK	Angles KLM, LKM, LMN, MNK
5.  Pentagon	5	5	Sides UV, VW, WX, XY, YU	Angles YUV, UVW, VWX, WXY, XYU

## Reteaching 68

Name: \_\_\_\_\_

This figure is a polygon. Each side is a segment. This side is segment EF.

6 sides, 6 angles

The sides form angles. These two sides form angle BCD.

Circle the polygons.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646.



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1-14 |
| average  | 1-14 |
| enriched | 1-14 |

**More Practice Set 68,**  
page 375

**Homework to do with others** Tell students to ask two or three adults who drive, 1) to name several shapes that are used as traffic signs, and 2) to tell information that the shape conveys. Have students report briefly on their findings.

## Follow-Up

**Extra Practice** Have students collect pictures of things that suggest polygons and make up a bulletin board in the classroom using the pictures.

**Reteaching** Have students make models of polygons using toothpicks, straws, or pipe cleaners. The models may be glued to paper and displayed in class.

**Enrichment Using Concrete Materials** Have students use each of the pattern block shapes from the Math Kit to try to cover a piece of paper without overlapping and without leaving gaps.

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- $\$0.07 \times 6$  [\$0.42]
- $\$0.59 \times 5$  [\$2.95]
- $\$1.32 \times 4$  [\$5.28]
- $\$4.50 \times 7$  [\$31.50]
- $\$0.73 \times 61$  [\$44.53]
- $\$1.05 \times 36$  [\$37.80]

**Answers, page 187**

**14. Answers will vary. Samples are given.**

**Square:** do not enter, no turn on red  
**Square (diamond):** stop ahead; pedestrian crossing

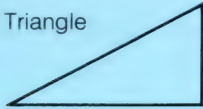
**Rectangle:** one way, speed limit

**Triangle:** no passing, slow moving vehicle

**Pentagon:** school crossing

For each polygon, write the number of sides and the number of angles.

4. Triangle



3, 3

5. Quadrilateral



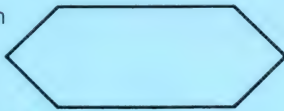
4, 4

6. Pentagon



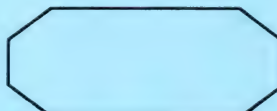
5, 5

7. Hexagon



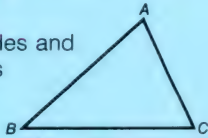
6, 6

8. Octagon



8, 8

9. Name the sides and angles of this triangle.



Sides AB, BC, CA  
Angles ABC, BCA, CAB

10. How many angles does a 9-sided polygon have?

9 angles

**Apply** Name the road sign below that suggests each shape.

11. Triangle

Yield

12. Octagon

Stop

13. Quadrilateral

Speed limit  
and dead-end

14. **Find the facts.** Name other road signs whose shapes are polygons.

Answers will vary.  
See margin for examples.



More Practice Set 68, page 375 187

## Enrichment 68

Name: \_\_\_\_\_ E68

**Collinear Points**

Points that lie in a straight line are called **collinear points**. 1 line can be drawn through them.

For each exercise, draw lines through collinear points. Use each point exactly twice. Then write the name of the figure that is formed.

1. Quadrilateral

2. Triangle

3. Pentagon

4. Octagon

5. Hexagon

6. Quadrilateral

## Additional Resource 68



### Math Poster BB Polygons

Two triangles, four quadrilaterals, one pentagon, one hexagon, and one octagon are drawn in red. See Answer Key for uses with other lessons.



## Objective 69

Identify congruent segments and polygons.

### Lesson Theme

Recreation: Jigsaw Puzzles

### Vocabulary

Congruent polygons, congruent segments

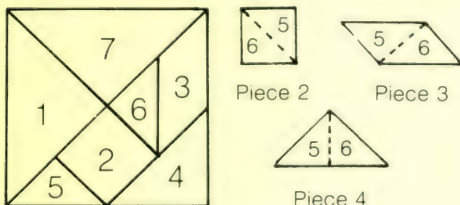
### Materials

- Dot paper (Teaching Aid J)
- Tangrams (Math Kit)
- Tracing paper

## Introduction

Draw pairs of line segments of obviously different lengths on the board. Have the students decide in each case which line is longer or shorter. Now draw pairs of line segments (not parallel to each other) that are the same length. Have students decide in each case if the lines are the same length. Ask for students' ideas about a way to compare lengths of line segments without using a ruler. [Tracing]

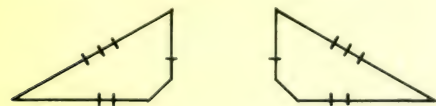
**Using Concrete Materials** Have students show which tangram pieces are congruent. [Triangles 1 and 7, triangles 5 and 6] Then ask students to use pieces 5 and 6 to make a figure congruent to piece 2; congruent to piece 3; congruent to piece 4.



## Using the Pages

**Teach** **Using Concrete Materials** For Example A, ask students if they can think of a way other than tracing to find if segments AB and CD are congruent. [They can measure the segments]

In Example B, be sure students realize that the polygons can be turned to match tracings. You might want to show students an example where flipping a tracing of a polygon enables them to match it to another polygon.



For Example C, help students realize that they can count the dots to draw a congruent shape. (Continued on page 189.)

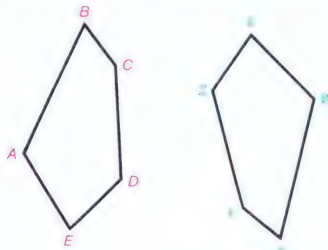
## Congruence

- A.** Segments that are the same length are **congruent segments**. Are segments AB and CD congruent?



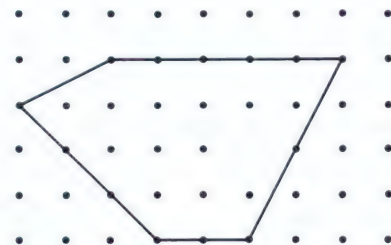
Use tracing paper to trace segment CD. Place the tracing over segment AB. Are the segments congruent? **Yes**

- B.** Polygons that are the same size and shape are **congruent polygons**. Are these polygons congruent?



Use tracing paper to trace one of the polygons. Place the tracing over the other polygon. Are the polygons congruent? **Yes**

- C.** Dot paper can be used to draw congruent figures. Draw a polygon that is congruent to the one at the right.



How do you know the polygons are congruent? How can you show that the polygons are congruent?

**They are the same shape and size. Use tracing paper to show that the polygons are congruent.**

**Try** Use tracing paper to tell whether the segments or polygons are congruent. Write yes or no.



**No**



**No**

- c.** Use dot paper and draw two segments that are congruent. Exchange papers with another student and check each other's drawings.

**Answers will vary.**

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## Practice 69

Tell whether the segments or polygons are congruent. Write yes or no.

|            |            |
|------------|------------|
| 1.         | 2.         |
| <b>Yes</b> | <b>No</b>  |
| 3.         | 4.         |
| <b>No</b>  | <b>Yes</b> |
| 5.         | 6.         |
| <b>Yes</b> | <b>No</b>  |
| 7.         | 8.         |
| <b>Yes</b> | <b>Yes</b> |
| 9.         | 10.        |
| <b>No</b>  | <b>Yes</b> |
| 11.        | 12.        |
| <b>Yes</b> | <b>No</b>  |
| 13.        | 14.        |
| <b>No</b>  | <b>Yes</b> |

## Reteaching 69

The sides of this figure are congruent segments. They are the same length.

Those are congruent polygons. They have the same size and shape.



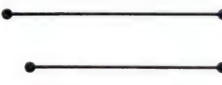
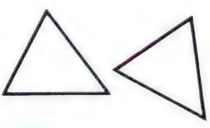


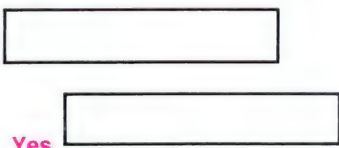
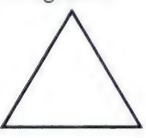
In what state were 8 presidents born?

Match the congruent segments or congruent polygons. Write the letter of each exercise in the correct blank to the right.

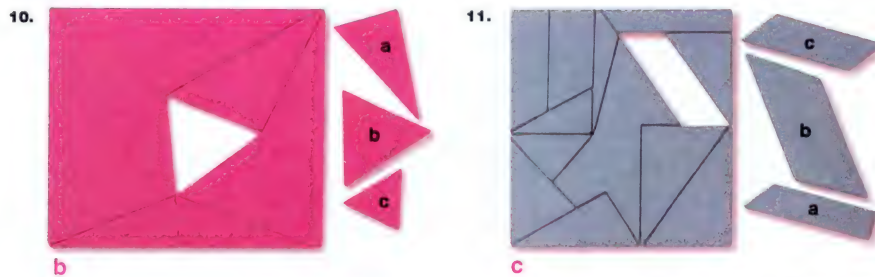
|    |  |          |
|----|--|----------|
| 1. |  | <b>V</b> |
| 2. |  | <b>G</b> |
| 3. |  | <b>R</b> |
| 4. |  | <b>P</b> |
| 5. |  | <b>N</b> |
| 6. |  | <b>L</b> |
| 7. |  | <b>A</b> |
| 8. |  | <b>I</b> |



**Practice** Use tracing paper to tell whether the segments or polygons are congruent. Write *yes* or *no*.

1.  **Yes**
2.  **No**
3.  **No**
4.  **Yes**
5.  **Yes**
6.  **No**
7.  **Yes**
8. Are all the sides of this triangle congruent?  
 **Yes**
9. Use dot paper to draw two polygons that are congruent. Exchange papers with another student and check each other's drawings.  
**Answers will vary.**

**Apply** Tell which shape will fit in the space.



More Practice Set 69, page 376 189

## Assignment Guide

|          |           |
|----------|-----------|
| basic    | 1–7, 9–10 |
| average  | 1–11      |
| enriched | 1–11      |

**More Practice Set 69, page 376**

(Continued from page 188.)

**Practice Estimation** Encourage students to try to determine if two segments or polygons are congruent without tracing. Then have them check their answers by tracing.

**Apply Problem Solving** Ask students to suggest strategies they could use to solve Problems 10 and 11. [They could trace the shapes to be filled and compare them to the pieces.]

**Error Analysis** Watch for students who forget to turn or flip their tracings to check for congruent polygons in Exercises 10 and 11. Remind these students that even though two polygons may not appear to be congruent, turning or flipping one of them may show that they are congruent.

## Follow-Up

**Extra Practice** Have the students draw four quadrilaterals: one with no congruent sides, one with two congruent sides, one with three congruent sides, and one with four congruent sides.

**Enrichment** Have students list items in everyday life that have the same size and shape. [Doors, window panes, sheets of paper, and so on]

## Reading and Writing Mathematics

Have students use the glossary to write the meanings of the following words: angle [The figure formed by two rays with the same endpoints], segment [Part of a line including the two endpoints], endpoint [The point at the end of a segment or a ray]

## Daily Maintenance

**Mental Math** Encourage students to do these exercises mentally.


1.  $12 - 6$  [6]
2.  $13 - 9$  [4]
3.  $11 - 7$  [4]
4.  $3 - 3$  [0]
5.  $15 - 6$  [9]
6.  $13 - 5$  [8]

## Enrichment 69







Name: \_\_\_\_\_ E69


**Jigsaw 1**

There are 2 shapes in this figure that are congruent. Can you find them? The figure below shows you where they are.



In each of the following figures, use heavy lines to show a pair of congruent shapes.

1. 
2. 
3. 
4. 
5. 
6. 

7. 

There are a lot of congruent shapes in this figure. How many pairs of congruent shapes can you find?

**Answers will vary.** Several examples are shown.

## Additional Resource 69

Name: \_\_\_\_\_ Additional Resource 69

**Computer Logo: Drawing Polygons**

In Logo the REPEAT command can save typing the same instructions over and over.

**REPEAT 4** [FD 50 RT 90]

Tells how many times to repeat a list of commands. This is the list of commands that will be repeated.

Type each of the following lines into the computer and write the names of the shapes in the blanks.

Name \_\_\_\_\_

1. CS REPEAT 4 [FD 30 RT 90] Square
2. CS REPEAT 3 [FD 30 RT 120] Triangle
3. CS REPEAT 5 [FD 40 RT 72] Pentagon
4. CS REPEAT 6 [FD 40 RT 60] Hexagon

Answers for Exercises 5–7 will vary. Sample answers are given.

5. Write a REPEAT instruction to draw an octagon.  
CS REPEAT 8 [FD 30 RT 45]
6. Use REPEAT to draw a rectangle.  
CS REPEAT 2 [FD 80 RT 90 FD 20 RT 90]
7. Use PU and PD along with one of the above REPEAT instructions to put several congruent shapes on the screen.  
CS REPEAT 3 [FD 30 RT 120 RT 45 REPEAT 3 [FD 30 RT 120] PU FD 40 PD REPEAT 3 [FD 30 RT 120]



## Objective 70

Identify parallelograms, rectangles, and squares.

### Vocabulary

Parallelogram, rectangle, square

### Materials

- Dot paper (Teaching Aid J)
- Centimeter Grid (Teaching Aid K)
- Geoboards (Math Kit)
- Rubber bands (Math Kit)

## Introduction

**Warm-Up Review** Have students draw three pairs of parallel lines, three pairs of intersecting lines, three right angles, and three angles that are not right angles.

Show models of drawings of several parallelograms, including some rectangles and squares. Have students identify the parallelograms that have four right angles. Have them name these as rectangles or squares.

## Using the Pages

### Teach Reading and Writing Mathematics

On the board, draw different examples of a parallelogram. Include rectangles and squares because they have opposite sides that are parallel and congruent. Then discuss rectangles. Show the students that only certain parallelograms, those with four right angles, are considered rectangles. Also notice that a special kind of rectangle has four congruent sides and is called a square.

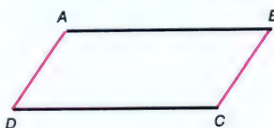
**Try** After students do Exercises a–c, ask how many sides each of the polygons has. [4] Ask them what four-sided polygons are called. [Quadrilaterals] Explain that parallelograms are a special group of quadrilaterals.

**Practice Error Analysis** In Exercises 1–8, watch for students who do not identify the squares and rectangles as parallelograms. Have these students ask themselves the following questions for each exercise. Does the figure have four sides? Are opposite sides of the figure parallel? Are opposite sides of the figure congruent? Explain that if they can answer yes to each of these questions, then the figure is a parallelogram. Remind them that rectangles and squares are special parallelograms. In Exercise 12, be sure the students identify the square as a rectangle. Explain that a square is a parallelogram with four right angles so it is a rectangle.

## Parallelograms



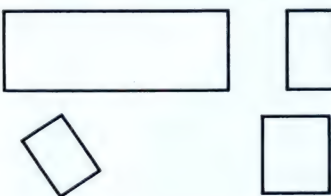
- A.** A **parallelogram** is a special four-sided polygon. Its opposite sides are parallel and congruent.



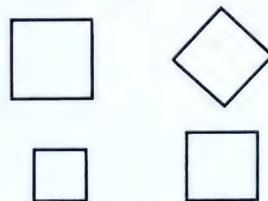
Sides  $AB$  and  $DC$  are parallel and congruent.

Sides  $AD$  and  $BC$  are parallel and congruent.

- B.** A **rectangle** is a special parallelogram with four right angles. These figures are rectangles.



- C.** A **square** is a special rectangle with four congruent sides. These figures are squares.



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## Practice 70

Name \_\_\_\_\_

Help the knight find his way out of the castle. First shade each polygon that is named correctly. Then follow the path through the rooms that contain shaded polygons.

P70

## Reteaching 70

Name \_\_\_\_\_

R70

A parallelogram has 4 sides. Its opposite sides are parallel and congruent.

A rectangle is a parallelogram with four right angles.

A square is a rectangle with four congruent sides.

Only the opposite sides are parallel and congruent.

A square is also a parallelogram.

Circle every letter that is inside a square or rectangle.

Circle every letter that is inside a parallelogram.

Remember: Squares and rectangles are parallelograms.

Which state is called the "Bread and Butter State"?

Write the circled letters in their correct order.

M I N N E S O T A



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–20 |
| average  | 1–20 |
| enriched | 1–20 |

**More Practice Set 70,**  
page 376

## Follow-Up

**Extra Practice** Cover a bulletin board with graph paper or dot paper. Use four thumbtacks and a piece of string or yarn about 1 foot long (ends tied together). Have students come to the bulletin board and make different four-sided shapes using the thumbtacks and string.

## Reteaching Using Concrete Materials

Have students make several parallelograms on their geoboards. Remind them that opposite sides must be parallel and congruent. Ask them to make a parallelogram with four right angles. Have the students identify these parallelograms as rectangles. Next ask the students to make a parallelogram with four right angles and four congruent sides. Have them identify these parallelograms as squares.

**Enrichment** Have students make a parallelogram, a rectangle, and a square using a geoboard or the same materials as they did for the *Extra Practice* activity above. Ask them to determine which shape has the most space inside. [The square] Students can count square units within the shapes to verify their answers.

Discuss this question: "If you have 12 meters of fence to make a garden with straight sides, what shape would you make the garden so you had the most amount of space inside?"

[Square]

## Cooperative Learning Groups

See page 480 of this Teacher's Edition.

## Daily Maintenance

**Estimation** Estimate each difference. First round each number to the nearest hundred.

- 847 – 115 [700]
- 386 – 153 [200]
- 254 – 103 [200]
- 189 – 121 [100]
- 1,226 – 915 [300]
- 1,632 – 801 [800]

**Try** For each exercise, write yes or no.

a. Is this figure a parallelogram?



No

b. Is this figure a rectangle?



Yes

c. Is this figure a square?



No

**Practice** Is each figure a parallelogram? Write yes or no.



Yes



Yes



No



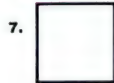
No



Yes



No



Yes



Yes

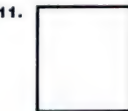
Is each figure a rectangle? Write yes or no.



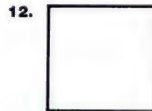
Yes



No



Yes



Yes



No



No

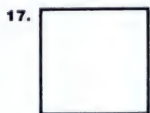


No



Yes

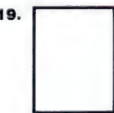
Is each figure a square? Write yes or no.



Yes



No



No



Yes

More Practice Set 70, page 376 191

## Enrichment 70

Name \_\_\_\_\_ E70

**Using Parallels**

In this figure, sides CJ and DK are parallel. AD, EF, GK, and LM are all parallel. AE, BG, DI, HL, and KM are also parallel.

1. AB 3

2. JK 2

3. BD 6

4. KM 5

5. BF 2

6. DI 5

7. NJ 3

8. LM 8

## Additional Resource 70

Name \_\_\_\_\_ Additional Resource 70

**Maintenance**

Multiply.

|  |  |  |  |
|--|--|--|--|
| 1. $\begin{array}{r} 41 \\ \times 2 \\ \hline 82 \end{array}$        | 2. $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$       | 3. $\begin{array}{r} 234 \\ \times 2 \\ \hline 468 \end{array}$      | 4. $\begin{array}{r} 75 \\ \times 5 \\ \hline 375 \end{array}$       |
| 5. $\begin{array}{r} 52 \\ \times 7 \\ \hline 364 \end{array}$       | 6. $\begin{array}{r} 60 \\ \times 8 \\ \hline 480 \end{array}$       | 7. $\begin{array}{r} 73 \\ \times 5 \\ \hline 365 \end{array}$       | 8. $\begin{array}{r} 64 \\ \times 4 \\ \hline 256 \end{array}$       |
| 9. $\begin{array}{r} 185 \\ \times 3 \\ \hline 555 \end{array}$      | 10. $\begin{array}{r} 79 \\ \times 8 \\ \hline 632 \end{array}$      | 11. $\begin{array}{r} 104 \\ \times 9 \\ \hline 936 \end{array}$     | 12. $\begin{array}{r} 83 \\ \times 7 \\ \hline 581 \end{array}$      |
| 13. $\begin{array}{r} 2403 \\ \times 6 \\ \hline 14,418 \end{array}$ | 14. $\begin{array}{r} 505 \\ \times 6 \\ \hline 3,030 \end{array}$   | 15. $\begin{array}{r} 434 \\ \times 7 \\ \hline 3,038 \end{array}$   | 16. $\begin{array}{r} 670 \\ \times 8 \\ \hline 5,360 \end{array}$   |
| 17. $\begin{array}{r} 5195 \\ \times 3 \\ \hline 15,585 \end{array}$ | 18. $\begin{array}{r} 456 \\ \times 5 \\ \hline 2,280 \end{array}$   | 19. $\begin{array}{r} 811 \\ \times 9 \\ \hline 7,299 \end{array}$   | 20. $\begin{array}{r} 543 \\ \times 6 \\ \hline 3,258 \end{array}$   |
| 21. $\begin{array}{r} 1357 \\ \times 6 \\ \hline 8,142 \end{array}$  | 22. $\begin{array}{r} 5274 \\ \times 7 \\ \hline 36,918 \end{array}$ | 23. $\begin{array}{r} 988 \\ \times 7 \\ \hline 6,916 \end{array}$   | 24. $\begin{array}{r} 767 \\ \times 9 \\ \hline 6,903 \end{array}$   |
| 25. $\begin{array}{r} 3075 \\ \times 6 \\ \hline 18,450 \end{array}$ | 26. $\begin{array}{r} 5555 \\ \times 5 \\ \hline 27,775 \end{array}$ | 27. $\begin{array}{r} 8050 \\ \times 4 \\ \hline 32,200 \end{array}$ | 28. $\begin{array}{r} 7210 \\ \times 7 \\ \hline 50,470 \end{array}$ |



## Objective 71

Find perimeters.

### Lesson Theme

Social Studies: Monuments

### Vocabulary

Perimeter

### Materials

- Rulers (Teaching Aid F, Punchouts, or Math Kit)

## Introduction

**Using Concrete Materials** Have students work in groups of three. Supply each group with large sheets of paper and rulers. Tell one student in each group to draw various polygons on one of the sheets of paper. Tell the second student to measure each side of the polygons in inches and record the measurements. Tell the third student to add the measurements for each figure to find the perimeter.

## Using the Pages

**Teach** Read through the opening problem. Remind students that a square is a polygon.

**Estimation** When several addends are all near one number, an estimation technique called *clustering* can be used. For example, in the sum  $87 + 94 + 84 + 88 + 91$ , all the addends are clustered around 90, so a reasonable estimate is  $5 \times 90$  or 450.

**Try Estimation** Tell students that they can use clustering to estimate a sum whenever all the numbers are close to the same number. For example,  $38 + 29 + 28 + 31 + 24 + 35 + 30$  is about 210 because the numbers cluster around 30.  $7 \times 30 = 210$ . The exact answer is 215. Another teaching example:

$198 + 187 + 195 + 203 + 218$  is about  $200 \times 5$ , or 1,000. The exact answer is 1,001.

**Practice Estimation** Have students experiment to determine the most accurate way to estimate the perimeters of these figures. [Rounding the two-digit addends to the nearest ten, adding the estimates, and then adding the single digit addends to that sum is one possible method.]

**Mental Math** When students are asked to find the perimeter of a parallelogram they may want to double each of the different measurements and then add. In Exercise 2,  $25 \times 2 = 50$  and  $15 \times 2 = 30$ ,  $50 + 30 = 80$ .

**Apply Problem Solving** For Problem 10, remind students that a pentagon has five sides.

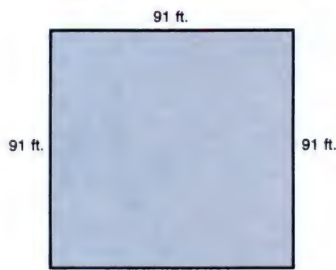
## Perimeter

The distance around a polygon is called its *perimeter*. The perimeter is found by adding the lengths of all the sides.

The base of the Statue of Liberty is a square. The length of each side is 91 feet. Find the perimeter.

Since the four sides of a square are the same length, you can round 91 to the nearest ten and multiply by 4 to find an estimated answer.

$$4 \times 90 = \text{■} \quad \mathbf{360}$$



$$91 + 91 + 91 + 91 = \mathbf{364}$$

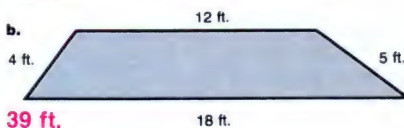
The perimeter of the base of the Statue of Liberty is 364 feet. Is the answer reasonable? **Yes**  
Why or why not? **364 is close to the estimate, 360.**

**Try** Find the perimeter of each figure. Work in groups. Discuss ways to estimate an answer for each exercise before computing the perimeter. **See Using the Pages.**



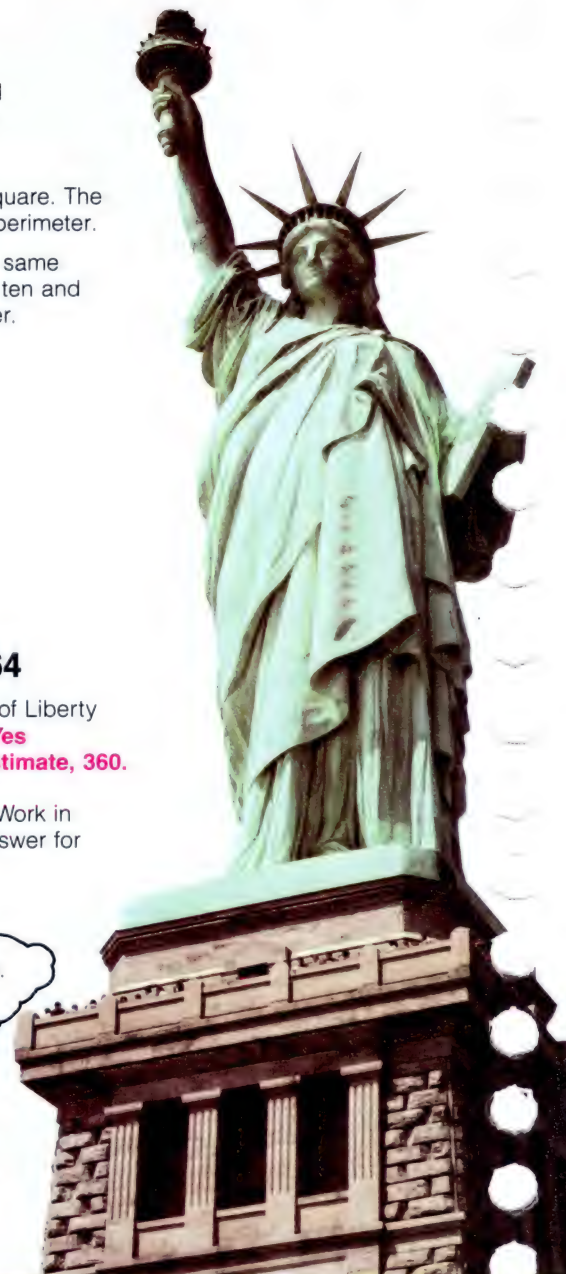
$$\mathbf{240 \text{ yd.}}$$

The numbers cluster near 50.  
Estimate:  
 $5 \times 50 = \text{■}$



$$\mathbf{39 \text{ ft.}}$$

$$\mathbf{192}$$



## Practice 71

Name \_\_\_\_\_

If April showers bring May flowers, what do May flowers bring?

Find the perimeter of each figure. Then write the letter for that answer in the code below. One answer is not used.

1. **168 ft. L**

2. **228 in. R**

3. **120 in. S**

4. **42 yd. I**

5. **33 in. A**

6. **41 ft. J**

7. **123 yd. G**

8. **74 ft. P**

9. **50 yd. M**

P I L G R J A M S

74 ft. 42 yd. 168 ft. 123 yd. 228 in. 41 ft. 50 yd. 120 in.

## Reteaching 71

Name \_\_\_\_\_

The distance around a polygon is called its perimeter.

7 in. 7 in. 7 in. 7 in. 7 in.

7 + 7 + 7 + 7 + 7 = 42

The perimeter is 42 inches.

Find the perimeter of each polygon.

1. **26 in.**

2. **18 ft.**

3. **18 ft.**

4. **11 mi.**

5. **60 in.**

6. **32 yd.**

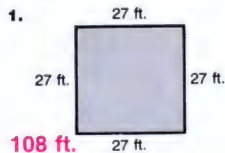
7. **24 ft.**

8. **22 mi.**

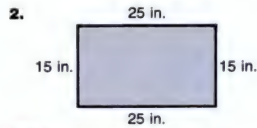


**Practice** Find the perimeter of each figure.

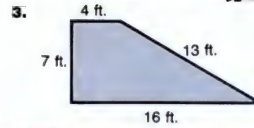
Be smart.  
Estimate when  
you calculate.



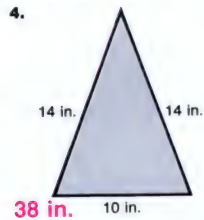
108 ft.



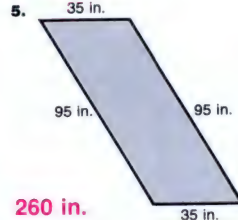
80 in.



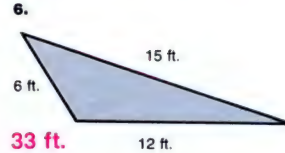
40 ft.



38 in.



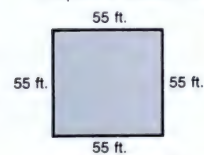
260 in.



33 ft.

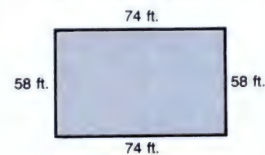
**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.  
For problems 7–10 find the perimeter.

7. Washington Monument  
Square base of shaft



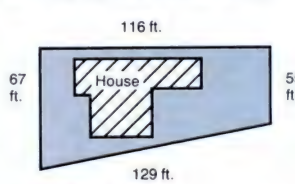
220 ft.; P, C

8. Lincoln Memorial  
Central chamber



264 ft.; P, C

9. The lot the house is on



367 ft.; C

10. The base of a lamp that is a pentagon, 10 cm on each side.

50 cm; M

11. *Write a problem.* Write a problem about the perimeter of something in your classroom. Then solve the problem.

Answers will vary.

12. **Calculator** Make the display show 100. Use only these keys: 3, 4, 5,  $+$ ,  $=$ .  
 $54 + 34 + 5 + 4 + 3 =$

## MAINTENANCE

Multiply.

1.  $\begin{array}{r} 68 \\ \times 6 \\ \hline 408 \end{array}$

2.  $\begin{array}{r} 57 \\ \times 9 \\ \hline 513 \end{array}$

3.  $\begin{array}{r} 48 \\ \times 3 \\ \hline 144 \end{array}$

4.  $\begin{array}{r} 29 \\ \times 7 \\ \hline 203 \end{array}$

5.  $\begin{array}{r} 567 \\ \times 2 \\ \hline 1,134 \end{array}$

6.  $\begin{array}{r} 321 \\ \times 5 \\ \hline 1,605 \end{array}$

7.  $9 \times 4,216$   
**37,944**

8.  $9,486 \times 2$   
**18,972**

9.  $6 \times \$0.36$   
**\$2.16**

10.  $\$1.32 \times 4$   
**\$5.28**

Using Problem-Solving Strategies, page 422  
More Practice Set 71, page 377 **193**

## Assignment Guide

basic 1–12  
average 1–12  
enriched 1–12

**More Practice Set 71,**  
**page 377**

## Follow-Up

**Extra Practice** Have the students measure and find the perimeter of several objects in the classroom or in their homes.

**Reteaching** Have students use a ruler to measure and find the perimeter of a sheet of notebook paper, this book, and a  $3 \times 5$  index card. Then have them draw a polygon on the sheet of notebook paper, measure and label the length of the sides to the nearest centimeter, and find the perimeter.

**Enrichment** Tell students to imagine they have 24 feet of fencing to make a pen for an animal. Have them find as many different sizes and shapes of pens as they can and record the dimensions for each. Examples:  
 $6 + 6 + 6 + 6 = 24$ ;  
 $10 + 10 + 2 + 2 = 24$ ;  
 $4 + 4 + 8 + 6 + 2 = 24$ .

**Calculator** Tell the students this rule for finding the perimeter of a square.

Length of side  $\times 4 =$  perimeter

Have them find the perimeter of squares with the following side lengths. Suggest that they make a chart to record their results. 16 cm [64 cm], 32 cm [128 cm], 64 cm [256 cm], 128 cm [512 cm], 9 cm [36 cm], 27 cm [108 cm], 81 cm [324 cm]

Then ask the students to conjecture about what happens to the perimeter of a square when the lengths of its sides double, [The perimeter doubles] when the lengths of its sides triple [The perimeter triples]

## Daily Maintenance

**Mental Math** Encourage students to do these exercises mentally.

- $4 \times 6$  [24]
- $3 \times 3$  [9]
- $0 \times 4$  [0]
- $6 \times 7$  [42]
- $7 \times 8$  [56]
- $9 \times 9$  [81]

**Using Problem-Solving  
Strategies, page 422**

## Enrichment 71

Name \_\_\_\_\_ E71

**Midpoints and Polygons**

In these quadrilaterals, the **midpoint**, or the point in the middle, of each side is marked.

Draw a polygon by connecting A to B, B to C, C to D, and D to A.

1.

2.

3.

Names \_\_\_\_\_

M Quadrilateral  
N Parallelogram  
O Rectangle  
P Square

Use the letters at the right to name the figure you drew.

4. in Exercise 1 **M, N, O, P**

5. in Exercise 2 **M, N, O**

6. in Exercise 3 **M, N**

Use a ruler to locate the midpoints of the sides of these figures. Then connect the midpoints to form a quadrilateral.

7.

8.

Use the letters to name the figure you drew.

9. in Exercise 7 **M, N**

10. in Exercise 8 **M, N, O**

## Additional Resource 71

Name \_\_\_\_\_ Additional Resource 71

**Computer Flow Charts**

Flow charts use special symbols to show the order of steps in a program.

Flow charts help you understand what your program should do before you begin to write it.

The flow chart below shows how to find the perimeter of a figure. Use the flow chart to find the perimeter of each figure.

```

    graph TD
      START([START]) --> LOOK[LOOK AT THE FIGURE]
      LOOK --> READ[READ LENGTH OF FIRST SIDE]
      READ --> ADD1[ADD LENGTH OF SECOND SIDE TO FIRST]
      ADD1 --> ADD2[ADD LENGTH OF NEXT SIDE]
      ADD2 --> IS_MORE{IS THERE ANOTHER SIDE?}
      IS_MORE -- YES --> ADD2
      IS_MORE -- NO --> PRINT[PRINT THE SUM OF THE SIDES]
      PRINT --> STOP([STOP])
  
```

Point to the next step.

1.

96 ft.

2.

378 in.

3.

90 yd.

Use after pages 192–193.



## Objective 72

Find areas by counting square centimeters.

### Lesson Theme

Art: Making Models

### Vocabulary

Area, square centimeter

### Materials

- Centimeter grid paper (Teaching Aid K)
- Counters (Punchouts)

### Introduction

Mention different surfaces in the classroom and ask students to compare, for example, the size of the surface of the chalkboard to the size of the surface of your desk top or the size of the surface of a student's desk top to the size of the surface of a piece of paper. Have students decide which object has the greater or lesser area.

**Using Concrete Materials** Give each student 8 to 12 unit-square counters from the punchouts. Have each student make a figure with his/her counters without overlapping any of the counters. Explain that the number of counters in his/her figure is the area of that figure in square units. Have students whose figures have the same area compare the shapes of their figures.

### Using the Pages

**Teach** Discuss the example. Introduce the square centimeter as a unit with which to measure area. In this lesson, students simply count the squares to find the area, although some of the more able students may see addition and multiplication shortcuts they can use. Encourage them to experiment with their shortcuts and check the results by counting.

**Try** Students could imagine each figure to be a counter top to aid them in reinforcing the idea of a surface.

**Practice** Exercises 11 and 12 are starred because students must see that two halves of a square centimeter make up one whole square centimeter.

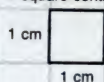
**Apply Problem Solving** Ask a student to read the problems aloud.

**Error Analysis** Watch for students who have difficulty in drawing the figures. Assist them if necessary.

### Area

The *area* of a figure is the number of square units covered by the figure.

1 square centimeter



The *square centimeter* is a unit of area.

Jerry is making a miniature model of a farm. The barnyard covers the area shown on the grid below. What is the area of the barnyard?



You can find the area of the barnyard by counting the number of square centimeters it covers.

The area of the barnyard is 54 square centimeters.

**Try** Find the area of each figure in square centimeters.

a.



12 square centimeters

b.



9 square centimeters

194

### Practice 72

Name: \_\_\_\_\_ P72

Find the area of each figure in square centimeters.

- 16 square centimeters
- 10 square centimeters
- 10 square centimeters
- 18 square centimeters
- 9 square centimeters
- 9 square centimeters
- 13 square centimeters
- 13 square centimeters
- 11 square centimeters

### Reteaching 72

Name: \_\_\_\_\_ R72

Each square is 1 square centimeter.

Count the squares to find the area.

The area is 7 square centimeters.

Find the area of each figure in square centimeters.

- 8 square centimeters
- 9 square centimeters
- 10 square centimeters
- 18 square centimeters
- 11 square centimeters
- 15 square centimeters
- 24 square centimeters



## Assignment Guide

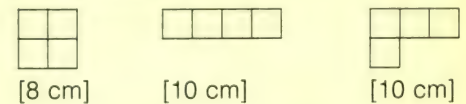
|          |             |
|----------|-------------|
| basic    | 1–10, 13    |
| average  | 1–10, 13–14 |
| enriched | 1–14        |

**More Practice Set 72,**  
page 377

## Follow-Up

**Extra Practice** Give students centimeter grid paper and have them draw figures of their own and find the areas of the figures in square centimeters.

**Enrichment** Have students draw as many different figures with an area of 4 square centimeters as they can. Then have them compare the perimeters. Some examples:



## Reading and Writing Mathematics

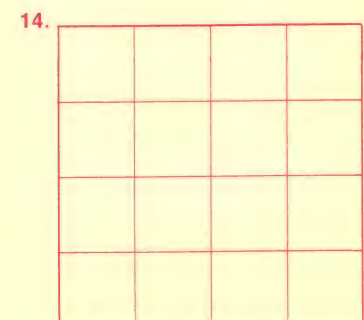
To encourage students to use the index, have them look up the following terms in the index and list some pages that contain these terms: right angle [pages 184, 185, 190], congruence [pages 188, 189], rectangle [pages 190, 191]

## Daily Maintenance

Which number is less?

- 21 or 16 [16]
- 513 or 315 [315]
- 111 or 110 [110]
- 7,435 or 7,439 [7,435]
- 71 or 81 [71]
- 490 or 409 [409]
- 3,330 or 3,303 [3,303]
- 7,832 or 8,723 [7,832]

## Answers, page 195



**Practice** Find the area of each figure in square centimeters.

- 12 square centimeters
- 9 square centimeters
- 7 square centimeters
- 10 square centimeters
- 14 square centimeters
- 10 square centimeters
- 8 square centimeters
- 9 square centimeters
- 10 square centimeters
- 8 square centimeters
- 9 square centimeters
- 10 square centimeters
- 3 square centimeters

**Apply** For each problem, draw the figure on centimeter grid paper.

- On Jerry's model farm, the floor of the barn is a rectangle that is 3 cm long and 2 cm wide. What is the area covered by the barn?  
6 square centimeters  
See margin for drawings.
- On Jerry's model farm, one field is a square that is 4 cm long on each side. What is the area of the field?  
16 square centimeters

More Practice Set 72, page 377 195

## Enrichment 72

Name: \_\_\_\_\_ E72

**Perimeter and Area**  
Find the area and perimeter of each. Each unit represents 1 square centimeter (1 cm<sup>2</sup>).

- Area: 4 cm<sup>2</sup> Perimeter: 8 cm
- Area: 6 cm<sup>2</sup> Perimeter: 10 cm
- Area: 9 cm<sup>2</sup> Perimeter: 12 cm

Each square on the grid below represents 1 cm<sup>2</sup>. Draw a figure with:

- an area of 5 cm<sup>2</sup> and a perimeter of 10 cm.
- an area of 5 cm<sup>2</sup> and a perimeter of 12 cm.
- a perimeter of 12 cm and an area of 8 cm<sup>2</sup>.
- a perimeter of 12 cm and an area of 7 cm<sup>2</sup>.

## Additional Resource 72

In each row, which figure has an area different from the others?

## Math Poster CC Area

Beginning with the top row, the first, middle, last, middle, and first figure has an area different from the others in its row.



## Using Problem-Solving Strategies

- Find a pattern.

### Materials

- Rulers

### Introduction

Students examine simple closed curves and find how to determine when two points are both inside a curve, two points are both outside a curve, or one point is inside and one point is outside.

### Using the Pages

Many students may find it difficult at first to determine whether the lion is inside or outside the cage. The problems which follow should help students find a pattern.

First, you may want to review the terms used in this lesson. A simple closed curve is a curve that does not cross itself and ends where it began. It can be drawn with one continuous motion of a pencil. A line segment is a straight path from one point to another.

Have students copy the curve at the bottom of page 196 and draw the segments to answer Problems 1–6. They should discover that any segment connecting two inside points will cross the curve an even number of times. Likewise, any segment connecting two outside points will cross the curve an even number of times.

To answer Problem 7, have students draw several segments connecting a point on the inside to a point on the outside. Students should find that any segment connecting one outside point and one inside point will cross the curve an odd number of times.

These results indicate that if the location of one point is known, the location of the other point can be determined by drawing a segment that connects the two points, and counting the number of times the segment crosses the curve. The students' discoveries can be summarized in a table.

| First point is | Number of times curve is crossed by segment that connects the points | Then second point is |
|----------------|--|----------------------|
| Outside        | Even   | Outside              |
| Outside        | Odd  | Inside               |
| Inside         | Even   | Inside               |
| Inside         | Odd  | Outside              |

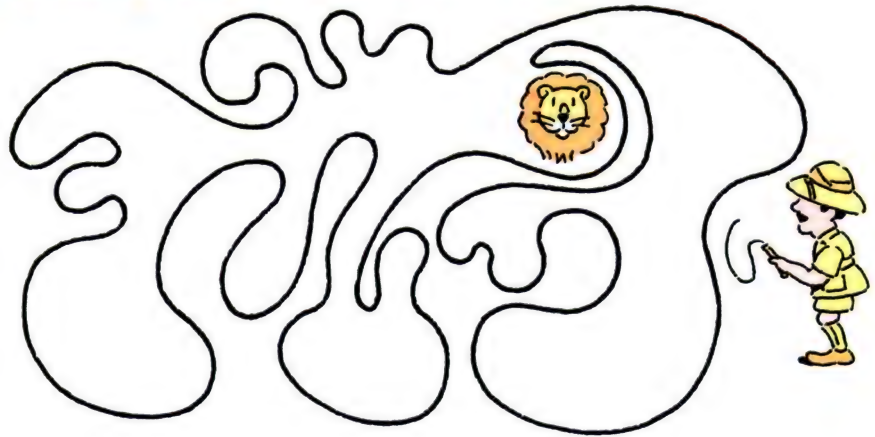
To answer Problem 9, students should count the number of times a segment connecting the lion tamer and the lion crosses the cage. Since it crosses the cage 3 times, the lion is inside.

(Continued on page 197.)

## Using Problem-Solving Strategies

Exploring Closed Curves

# CAGEY CAGES

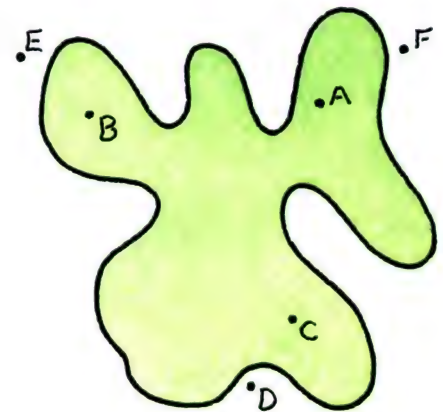


The lion tamer is outside the cage.  
Is the lion inside the cage or outside the cage?

If you do not know, guess. Then work Problems 1–8 to find out how you can tell.

A simple closed curve has an inside and an outside. In the curve at the right, points A, B, and C are in the inside. Points D, E, and F are outside the curve.

Copy the curve, including points A–F. Use your drawing for Problems 1–8.





## COMPUTER

### LOGO: REPEAT Commands

Imagine a segment between two inside points. How many times does the segment cross the curve between these points?

1. A and B  
4 times
2. A and C  
2 times
3. B and C  
0 times

How many times does a segment cross the curve between these outside points?

4. D and F  
4 times
5. D and E  
4 times
6. E and F  
6 times

7. How many times does a segment cross the curve going between one outside point and one inside point? Try several pairs of points to help you answer the question.

See margin.

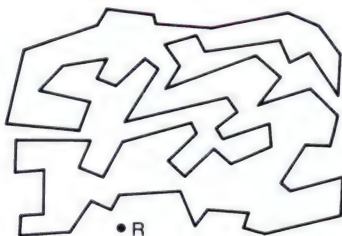
8. If you know the location of one point, how can you determine the location of another?

See margin.

9. Is the lion inside the cage or outside the cage?

Inside

10. Copy the closed figure below. Point R is outside the figure. Color the inside. See margin.



In LOGO, the Turtle is a small triangle on the computer screen. This turtle can follow commands that make it do special things.

The REPEAT command has two parts. The first part is a number that tells how many times to repeat a list of commands. The second part is a list of commands that are inside two brackets [ ].

REPEAT 4 [FD 30 RT 90] tells the Turtle to complete the following directions 4 times: move forward 30 steps and turn right 90 (make a square corner).

When the turtle follows the command REPEAT 4 [FD 30 RT 90], a square is drawn. The length of each side of the square is 30 steps. Since there are 4 sides, the perimeter of the square is 120 steps.

In each exercise, the REPEAT command tells the turtle to draw a square. Find the perimeter of each square.

1. REPEAT 4 [FD 50 RT 90]  
200 steps
2. REPEAT 4 [FD 25 RT 90]  
100 steps
3. REPEAT 4 [FD 10 RT 90]  
40 steps
4. REPEAT 4 [FD 40 RT 90]  
160 steps
5. REPEAT 4 [FD 15 RT 90]  
60 steps
6. REPEAT 4 [FD 35 RT 90]  
140 steps

Using Problem-Solving Strategies, page 423 197

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1-10 |
| average  | 1-10 |
| enriched | 1-10 |

**Homework to do with others** Give the following assignment to students: Measure the perimeter of a room in your home with the help of another person. Prepare a drawing to show the shape of the room and label the drawing with the dimensions of the room. Bring your drawing to class.

(Continued from page 196.)

Students may complete Problem 10 by choosing several points and then determine whether the points are inside or outside.

### Computer

Explain that LOGO is another computer language that is used on microcomputers. Challenge students to write the LOGO commands for squares of various perimeters . . . 400, 20, and 80.

If you have LOGO available and students will do these exercises on the computer, they will need to type CS (CLEARSCREEN) before each new exercise.

### Follow-Up

Ask students to draw their own simple closed curves. Then have them exchange drawings with a partner, and have each student color the inside of the closed curve in the drawing.

### Calculator

The chart below shows the area and the population per square kilometer of several cities. Multiply the area by the population per square kilometer to find the population of each city.

| City        | Area | Population per km <sup>2</sup> |
|-------------|------|--------------------------------|
| Chicago     | 590  | 5,254                          |
| New York    | 830  | 9,036                          |
| St. Louis   | 160  | 3,125                          |
| Albuquerque | 290  | 982                            |
| Spokane     | 130  | 1,353                          |

[Chicago: 3,099,860; New York: 7,499,880; St. Louis: 500,000; Albuquerque: 284,780; Spokane: 175,890]

### Daily Maintenance

1.  $59 + 17$  [76]    2.  $148 + 36$  [184]
3.  $234 + 681$  [915]
4.  $1,406 + 7,534$  [8,940]

Using Problem-Solving Strategies, page 423



## Objective 73

Solve problems involving areas of triangles by using pictures.

### Lesson Theme

Art: Bulletin Board

### Materials

- Centimeter grid paper
- Crayons, colored pencils or markers

## Introduction

**Warm-Up Review** Remind students that congruent figures are those having the same shape and size. Hold up a rectangle cut from construction paper. Show some other figures and ask students to pick the ones that are congruent to the one you are holding.

**Motivational Situation** Pose this problem to the students. Suppose you were asked to decorate a bulletin board. What are some things you would need to consider? [What is the area of the bulletin board? What size sheets of paper will you use? How many sheets of paper will be needed? What is the perimeter of the bulletin board? How much border will be needed? What size letters will be used? How many pictures or figures will fit on the board?]

## Using the Pages

**Teach** Read and discuss the example. In the *Solve* step, use a square cut into two congruent triangles to show that two half squares make a whole square.

**Apply Problem Solving** In these problems, it may help students to count the half squares before counting the whole ones.

**Draw a picture** Have students use crayons, colored pencils, or markers to draw each figure on centimeter grid paper. Have them color each whole square a different color and pair the half squares so that each pair of half squares is colored a different color. Explain that the number of different colors used will be the same as the number of square units in the area of the figure.

**Calculator** Have students use the information in Problem 10 to answer the following questions.

- How many sheets of papers are in each box? [1,728]
- How many pads of paper are in 75 boxes? [2,700]

## Problem Solving Use a Picture

### Read

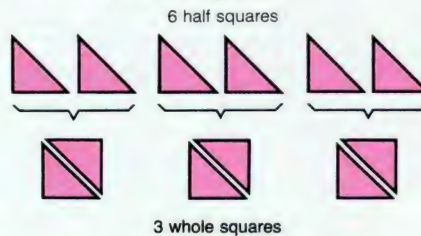
Dean is covering a bulletin board with right triangles cut from colored paper. The triangles are congruent to the red one shown. What is the area of each triangle Dean is using?

### Plan

Draw the right triangle on centimeter grid paper. Count the squares to find the area.

### Solve

Count the whole squares. There are 15. Combine the half squares.



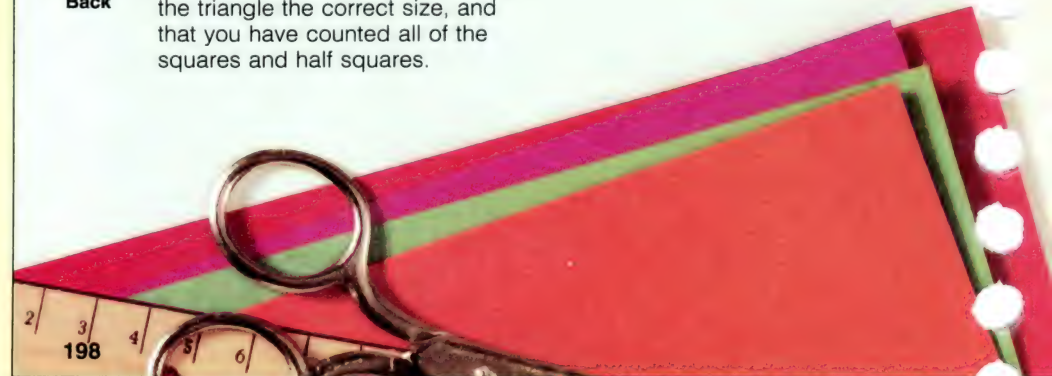
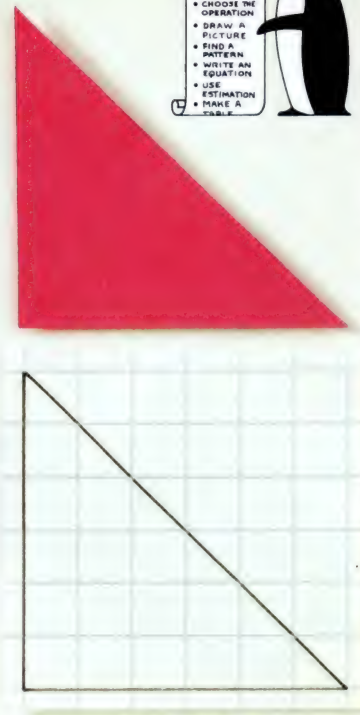
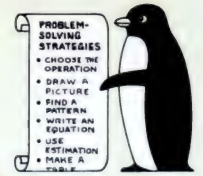
Find the total number of squares  
 $15 + 3 = 18$

### Answer

The area of each triangle Dean is using is 18 square centimeters.

### Look Back

Check to be sure you have drawn the triangle the correct size, and that you have counted all of the squares and half squares.



## Practice 73

Name: \_\_\_\_\_ P73

Find the area of each figure.

- 16 square centimeters
- 16 square centimeters
- 12 square centimeters
- 8 square centimeters
- 16 square centimeters
- 12 square centimeters
- 10 square centimeters
- 12 square centimeters
- 14 square centimeters

## Reteaching 73

Name: \_\_\_\_\_ R73

Find the area of this figure.

This is a square centimeter. This is a half square centimeter.

Count the whole squares. → 4  
Combine 1/2 a half squares. 4 half squares make → 2 whole squares.  
+ 2  
6

The area is 6 square centimeters.

Find the area of each figure.

- 4 square centimeters
- 6 square centimeters
- 8 square centimeters
- 12 square centimeters
- 20 square centimeters
- 14 square centimeters
- 17 square centimeters



## Assignment Guide

|         |         |
|---------|---------|
| basic   | 1-7, 10 |
| average | 1-8, 10 |
| average | 1-10    |

**More Practice Set 73,**  
page 378

## Follow-Up

**Extra Practice** Prepare a worksheet on centimeter grid paper with figures similar to those in the book, and have students find the area.

## Reteaching Using Concrete Materials

If students are having difficulty, encourage them to use squares and half squares to reconstruct each figure. Then, when counting the squares, they can actually place the half squares together to form whole squares to count.

## Cooperative Learning Groups

See page 480 of this Teacher's Edition.

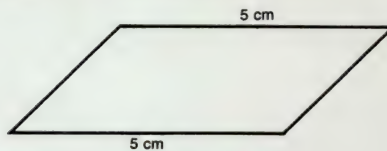
## Try

a. Find the area of this figure.



4 square centimeters

b. Trace this figure on centimeter grid paper. Then find the area.

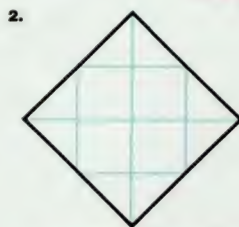


See margin for drawing.  
10 square centimeters

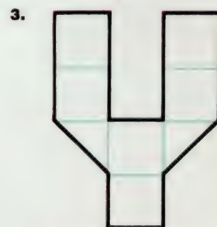
**Apply** Find the area of each figure.



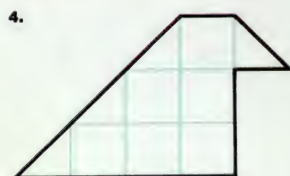
7 square centimeters



8 square centimeters



7 square centimeters



8 square centimeters

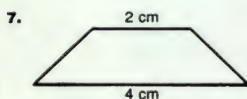


7 square centimeters

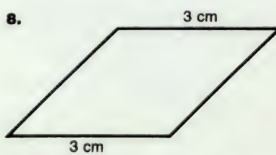


6 square centimeters

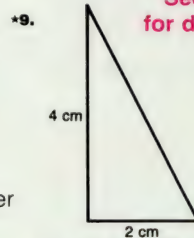
Trace each figure on centimeter grid paper. Then find the area.



3 square centimeters



6 square centimeters



4 square centimeters

See margin  
for drawings.

10. **Calculator** A paper company packages colored paper in 48 sheet pads with 36 pads in a box. How many sheets of colored paper are in 75 boxes?  
**129,600 sheets**

More Practice Set 73, page 378 199

## Daily Maintenance

**Estimation** Estimate each product.

- $9 \times 51$  [450]
- $3 \times 67$  [210]
- $57 \times 6$  [360]
- $61 \times 21$  [1,200]
- $52 \times 67$  [3,500]
- $17 \times 28$  [600]

**Answers, page 199**

**Drawings are not actual size.**



## Enrichment 73

Name \_\_\_\_\_ E73

**Area of Triangles and Parallelograms**

Use the hints to find the area of each figure that is outlined in the heavy line. Each unit represents 1 square centimeter (1 cm<sup>2</sup>).

- 12 cm<sup>2</sup>
- 6 cm<sup>2</sup>
- 14 cm<sup>2</sup>
- 16 cm<sup>2</sup>

I can change the figure into a rectangle.

I can split the triangle into 2 parts.

## Additional Resource 73

Name \_\_\_\_\_ Additional Resource 73

**Project An Area of 5**

Materials needed: graph paper, pencil, scissors

Follow these rules to find as many different shapes as you can with an area of 5 on a piece of graph paper.

- Each shape must have 5 squares.
- Two squares must touch on one side. Squares touching only at the corners do not count.

**Example:**

c. Congruent shapes count as only one shape.

- The are 12 different shapes that can be made following these rules. Draw as many as you can find on the graph paper. Cut out all the shapes you have made.
- Try to fold each shape into a box without a top. Which of the shapes can be folded this way?

The shapes with a can be folded this way



## Objective 74

Identify center, radius, and diameter of a circle.

### Lesson Theme

Technology: Wheels

### Vocabulary

Center, circle, diameter, radius

### Materials

- Circular objects
- Centimeter rulers (Teaching Aid G, Punchouts, or Math Kit)

## Introduction

Show students how to draw a circle using a compass. If you do not have enough compasses for the entire class, you may wish to have students use a circular object, such as a cup, a can, a round cookie cutter, a glass, or a large coin. Make sure that students understand that the center and the interior points are not points of the circle. A circle is just the curve without the points inside.

## Using the Pages

**Teach** *Using Concrete Materials* In Example A, tell students to fold their circles carefully. In Example B, students should name point K as the center of the circle, DF as a diameter, and either DK, KF, or KE as a radius. Point out that radius KE also could be written as EK, and that diameter DF can be written as FD.

Have students look up the definition of "circle" in the glossary.

**Try** Make sure that students understand that there are four radii in this exercise, even though they need name only one.

**Practice** *Error Analysis* Watch for students who confuse radius with diameter. Remind these students that a radius always has the center as an endpoint while the endpoints of a diameter are always points on the circle. (See Reteaching 74.)

In Exercise 13, students should see that each radius is half as long as each diameter. Diameter DF on circle K is 10 cm and each radius is 5 cm.

### Apply Problem Solving

**Work backward** Have students start with 73¢, and subtract 22¢ for the first ounce. To determine the number of additional ounces, have them subtract 17¢ from each difference until they get to 0¢. (The problem uses the rate for U.S. postage in effect in 1985.)

## Circles

Wheels are shaped like circles.

**See Using the Pages for a discussion of these examples.**

**A.** Draw a circle with a compass.

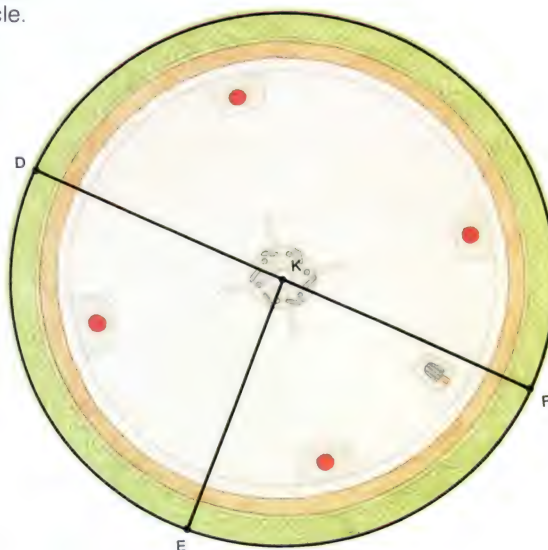
Your pencil mark is the circle.

Cut out the circular region.

Fold it in half and draw a line on the fold. This segment is a *diameter* of the circle.

Fold again to find another diameter. The two diameters meet at the *center* of the circle. Put a dot at the center of your circle.

A segment from the center of a circle to the circle is a *radius*. Show a radius of your circle.



**B.** Work in groups. Use the circle that is drawn over the bicycle wheel.

Each of you name the center, a diameter, and a radius.

Compare answers. Are they the same? Should they be? Explain why or why not.

Which of the labeled points are part of the circle?

**D, E, F**

**Try** Use the circle below.

- a.** Sometimes the center is used to name the circle. Name this circle.



**Circle W**

- b.** Name a diameter of the circle. How many diameters do you think there are in a circle? **Segment XZ or YU**  
**There are infinitely many diameters.**
- c.** Name a radius. How many radii do you think there are in a circle?  
**See margin.**
- d.** How many centers do you think a circle has? **One**

200

## Practice 74

Name \_\_\_\_\_ P74

Name the center, one radius, and one diameter of each circle. **Answers will vary.**

|  | Center | Radius | Diameter |
|--|--------|--------|----------|
|  | P      | PC     | AB       |
|  | T      | TX     | MN       |
|  | B      | BA     | AC       |
|  | D      | DL     | HB       |

Name things that are shaped like circles in the picture.

**Answers will vary but might include:**  
nose, plate, ring, wheel.

## Reteaching 74

Name \_\_\_\_\_ R74

Point M is the center of the circle.

Segment MP is one radius. Segment MN is another radius.

Segment LN is the diameter.

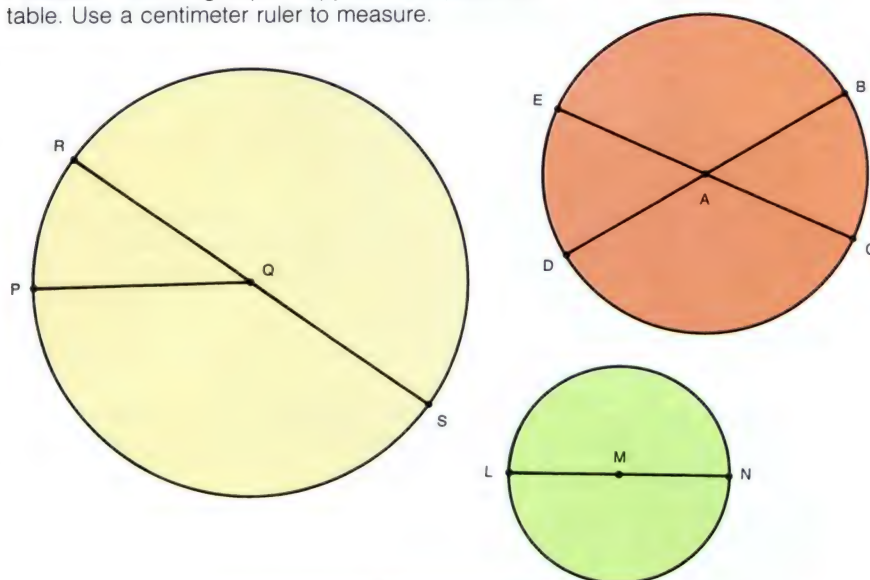
Complete the table.

Name the center, one radius, and one diameter of each circle. **Answers may vary for radii.**

| Circle | Center | Radius | Diameter |
|--------|--------|--------|----------|
|        | 1. B   | 2. BA  | 3. AC    |
|        | 4. Y   | 5. YX  | 6. XZ    |
|        | 7. F   | 8. FH  | 9. EG    |
|        | 10. S  | 11. ST | 12. RT   |



**Practice** Work in groups. Copy and complete the table. Use a centimeter ruler to measure.



|                        | Circle Q                 | Circle A                  | Circle M             |
|------------------------|--------------------------|---------------------------|----------------------|
| Name a diameter        | 1. Segment RS            | 5. Segment EC or BD       | 9. Segment LN        |
| Name a radius          | 2. Segment RQ, SQ, or PQ | 6. Segment AE, AB, AC, AD | 10. Segment LM or NM |
| Length of the diameter | 3. 8 cm                  | 7. 6 cm                   | 11. 4 cm             |
| Length of the radius   | 4. 4 cm                  | 8. 3 cm                   | 12. 2 cm             |

13. For each circle, compare the measures of the diameter and the radius. Do you see a pattern? If you do, test it on Circle W and Circle K on page 200.

**See margin.**

14. Write a sentence that compares the radius and the diameter of any circle. **In a circle with radius  $r$  and diameter  $d$ ,  $d = 2r$ .**

**Apply** Solve the problem.

15. Shawn has a letter with 73¢ postage. The postal rate was 22¢ for the first ounce and 17¢ for each additional ounce. How much did the letter weigh?

Discuss your strategy for solving the problem with your classmates.

**4 ounces**

More Practice Set 74, page 378 **201**

## Assignment Guide

basic 1–15  
average 1–15  
enriched 1–15

**More Practice Set 74, page 378**

## Follow-Up

**Extra Practice** Ask students to find the measures of diameters and radii of circular objects by tracing the circles and folding them as they did in Example A. Ask them to compare a diameter and radius in each circle.

## Reteaching Using Concrete Materials

Have students use the fraction models punchout frame for a fourth as a template to draw circles. Using two tic marks on opposite sides of the circle and a ruler, have the students draw a line to show a diameter. Using the other two opposite tic marks, have them draw another diameter. Lead students to see that the two diameters intersect at the center of the circle. Point out that the intersection of any two diameters is the center of the circle. Have them draw other pairs of diameters to check that this is always the case.

## Enrichment 74

Name \_\_\_\_\_ E74

**Design a Picture**

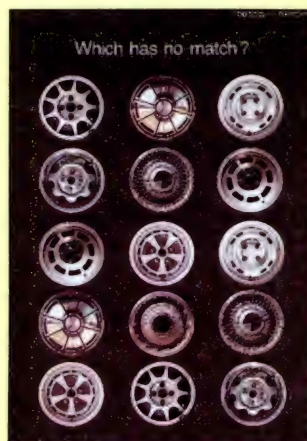
You can create designs by connecting points on a circle.

Add 4 to each number in the table to find which points are to be connected. Then connect them.

| Connect | Connect |
|---------|---------|
| 1 to 5  | 7 to 11 |
| 2 to 6  | 8 to 12 |
| 3 to 7  | 9 to 1  |
| 4 to 8  | 10 to 2 |
| 5 to 9  | 11 to 3 |
| 6 to 10 | 12 to 4 |

Add 5 to each number to find which points are to be connected in this figure. Then connect them.

## Additional Resource 74



### Math Poster DD Circles

The circle design that has no match is the middle one in the fourth row. See Answer Key for ways to extend this poster.

## Daily Maintenance

- $258 \times 80$  [20,640]
- $392 \times 20$  [7,840]
- $847 \times 30$  [25,410]
- $921 \times 90$  [82,890]
- $746 \times 50$  [37,300]

Answers, pages 200–201

- c. Segment WX, WY, WZ or WU.  
There are infinitely many radii.

13. Yes. In a circle, the length of a diameter is twice the length of a radius.

Circle W: diameter, 2 cm  
radius, 1 cm

Circle K: diameter, 10 cm  
radius, 5 cm



## Objective 75

Identify lines of symmetry.

### Lesson Theme

Science: Nature

### Vocabulary

Line of symmetry; symmetric

### Materials

- Pattern blocks (Math Kit)
- Scissors, tracing paper
- Mirrors
- Magazines

### Introduction

Cut out paper shapes (circle, square, rectangle) and mark them with one line of symmetry. Show that when the shapes are folded along the marked line, the two parts match. Also prepare some shapes that are not symmetric (a triangle with each side a different length). Show that these shapes cannot be folded so that the parts match.

**Using Concrete Materials** Divide the students into groups of 6. Give each group a mirror and each student in the group a different shaped pattern block. Have students take turns with the mirror on the block in such a way as to have the reflection in the mirror complete the shape. The line along which the mirror is placed is a line of symmetry. Encourage students to find more than one line of symmetry, if possible.

### Using the Pages

**Teach** Cut paper shapes like the ones in Examples A and B. Use the shapes to explain the examples.

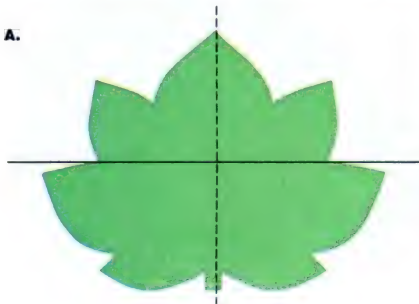
**Try Error Analysis** In Exercise a, be sure students trace the broken line so that they know where to fold the figure. In Exercise b, students can mark the lines of symmetry after they fold the figure. (See **Reteaching 75**.)

**Practice** Before students begin the exercises, use cutouts of several polygons to demonstrate how to fold to find lines of symmetry. In Exercises 1–5, students fold the figures on the broken line. In Exercises 6–8, they must find the lines of symmetry.

## Symmetry

A figure is symmetric if you can fold it and make the two parts match. The fold line is a *line of symmetry*.

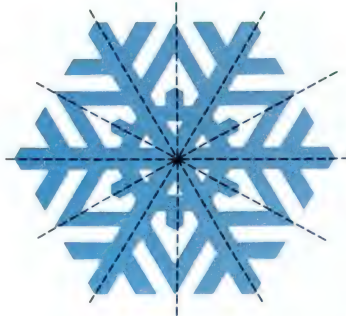
A.



When the figure is folded on the broken line, the two parts match. The figure is symmetric, and the broken line is a line of symmetry.

When the figure is folded on the solid line, the two parts do not match. The solid line is not a line of symmetry.

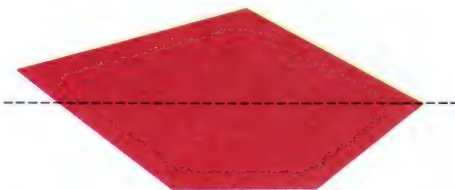
B.



When the figure is folded on any of the broken lines, the two parts match. The figure has 6 lines of symmetry.

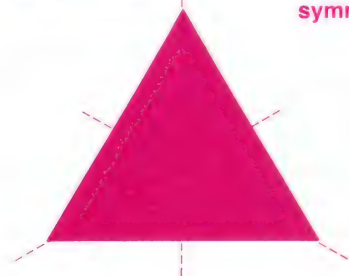
**Try** Trace each figure and cut it out.

- a. Is the broken line a line of symmetry?  
**No**



- b. How many lines of symmetry does this figure have?

**3 lines of symmetry**



202

## Practice 75

Name \_\_\_\_\_ P75

Trace each figure and cut it out.  
Is the broken line a line of symmetry?  
Write yes or no.

|                  |                 |                  |
|------------------|-----------------|------------------|
| 1.<br><b>No</b>  | 2.<br><b>No</b> | 3.<br><b>Yes</b> |
| 4.<br><b>Yes</b> | 5.<br><b>No</b> | 6.<br><b>Yes</b> |

Trace each figure and cut it out.  
How many lines of symmetry can you find by folding the figure?

|                     |                      |                     |
|---------------------|----------------------|---------------------|
| 7.<br><b>1 line</b> | 8.<br><b>8 lines</b> | 9.<br><b>1 line</b> |
|---------------------|----------------------|---------------------|

## Reteaching 75

Name \_\_\_\_\_ R75

The figure has 4 lines of symmetry. The two parts will match if you fold it on any of these lines.

Copy each figure. Fold along the dashed line. Is the line a line of symmetry? Write yes or no.

|                  |                 |
|------------------|-----------------|
| 1.<br><b>Yes</b> | 2.<br><b>No</b> |
| 3.<br><b>Yes</b> | 4.<br><b>No</b> |

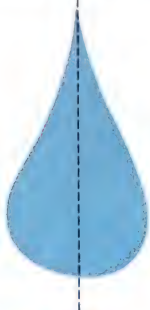
Draw all the lines of symmetry for each figure below.

|                      |                      |
|----------------------|----------------------|
| 5.<br><b>2 lines</b> | 6.<br><b>6 lines</b> |
|----------------------|----------------------|



**Practice** Trace each figure and cut it out. Is the broken line a line of symmetry? Write yes or no.

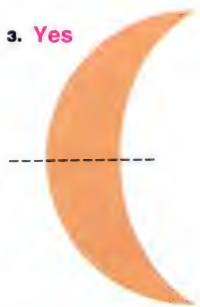
1. No



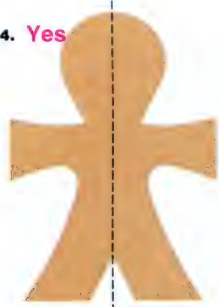
2. Yes



3. Yes



4. Yes

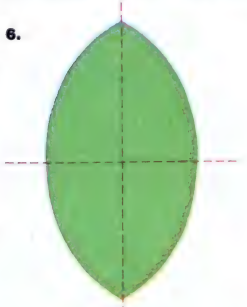


5. No



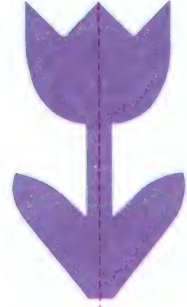
Trace each figure and cut it out. Tell how many lines of symmetry the figure has.

6.



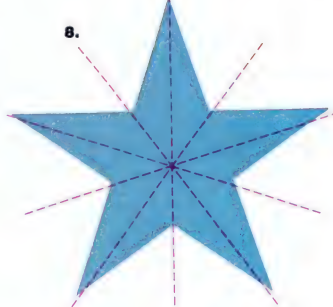
2 lines of symmetry

7.



1 line of symmetry

8.



5 lines of symmetry

More Practice Set 75, page 378 203

## Assignment Guide

basic 1-7

average 1-7

enriched 1-8

More Practice Set 75,  
page 378

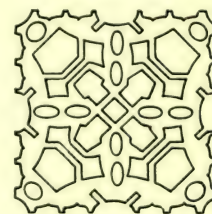
## Follow-Up

### Extra Practice Using Concrete Materials

Have students look through magazines for pictures of real-life objects such as plants, animals, furniture, and buildings that show symmetry. Students can cut out the pictures and use them to make up a bulletin board in the classroom about symmetry.

### Reteaching Using Concrete Materials

Students can find the lines of symmetry in paper shapes they make themselves. Have them begin with a square piece of paper folded in fourths. They should then fold the paper again along the diagonal and cut out or tear out a design.



**Enrichment Make a table** Give students each of these regular polygons.



Have students make a table comparing the number of sides and number of lines of symmetry for the polygons. Students should find that the number of sides is the same as the number of lines of symmetry.

### Daily Maintenance

- 3,600 - 1,439 [2,161]
- 1,007 - 983 [24]
- 2,402 - 157 [2,245]
- 3,700 - 1,247 [2,453]
- 1,038 - 746 [292]
- 5,001 - 3,999 [1,002]

## Enrichment 75

Name \_\_\_\_\_ E75

**Flips**

When a shape is flipped along one of its sides, the result is a symmetric figure.

Here is a shape flipped along each of its sides.

Draw a picture to show how you would flip each shape along each of its sides. Write the number of symmetric figures that can be made.

- 3
- 4
- 4
- 6

## Additional Resource 75



### Math Poster EE Symmetry

There is a horizontal line of symmetry for the car. See Answer Key and Notes for Teacher's Resource File for extensions.



## Objective 76

Identify spheres, cones, rectangular prisms, cylinders, and cubes.

### Lesson Theme

Home Activities: Birthday Party

### Vocabulary

Cone, cube, cylinder, rectangular prism, sphere

### Materials

- Three-dimensional shapes (Math Kit)
- Centimeter grid paper (Teaching Aid K)
- Pattern for a cube and a rectangular prism (Punchouts)

## Introduction

**Using Concrete Materials** Show real objects such as a ball, a paper cone, a tissue box, a can of food, and a square wood block, and ask students to describe the shapes.

## Using the Pages

**Teach** Read and discuss the example. Then have students name as many objects as they can (in or out of the classroom) having the shape of the geometric figures shown in the example.

Ask students to think of situations other than a birthday party where they may find many three-dimensional shapes. For example, at a basketball game players use a ball (sphere), cheerleaders use megaphones (cones), drinks are sold in cups (cylinders), and equipment is stored in boxes (rectangular prisms or cubes).

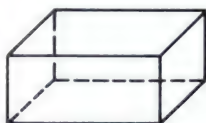
**Try** Be sure students can read and pronounce correctly the names of the geometric shapes.

**Practice Error Analysis** Watch for students who have difficulty relating a geometric shape to the objects in the exercises. Keep models of the geometric shapes on display so that the students can compare the objects in the exercises to the shapes. (See Reteaching 76.)

**Additional problem** Have students solve the following problem. Gretchen is planning a birthday party for 14 people. At the party store, invitations are sold in packages of 6, plates are sold in packages of 10, party hats are sold in packages of 8, napkins are sold in packages of 20, and party favors are sold in packages of 3. How many packages of each item would Gretchen need to buy? [3 packages of invitations, 2 packages of plates, 2 packages of party hats, 1 package of napkins, and 5 packages of party favors]

## Three-Dimensional Figures

Many objects around you have the shape of a *rectangular prism*, a *cube*, a *cylinder*, a *cone*, or a *sphere*.



Rectangular Prism



Cube



Cylinder



Cone



Sphere

**Try** Name the shape of each object below. Use *rectangular prism*, *cube*, *cylinder*, *cone*, or *sphere*.

a. Cone b. Sphere c. Cube d. Rectangular prism e. Cylinder



## Practice 76

Name: \_\_\_\_\_

Many objects around you have a basic shape. Name the shape of each object. Use *cylinder*, *cube*, *sphere*, *cone*, or *rectangular prism*.

1. Rectangular prism

2. Cylinder

3. Sphere

4. Cone

5. Cube

6. Rectangular prism

7. Cylinder

8. Sphere

9. Cone

## Reteaching 76

Name: \_\_\_\_\_

Many objects around you have a basic shape. Name the shape that you see in each object. Accept an answer student can justify.

1. Sphere

2. Rectangular Prism

3. Cylinder

4. Sphere

5. Cone

6. Cube

7. Cylinder

8. Rectangular Prism



## Assignment Guide

|          |     |
|----------|-----|
| basic    | 1-8 |
| average  | 1-8 |
| enriched | 1-8 |

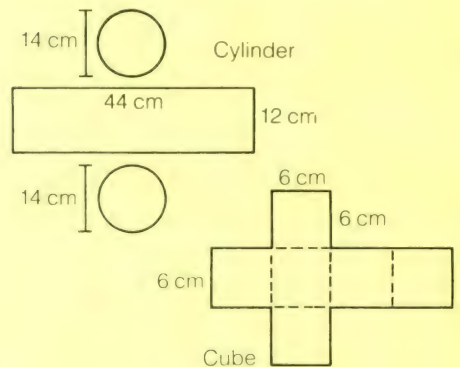
**More Practice Set 76,**  
page 379

## Follow-Up

**Reteaching** Make up a set of cards, each with a large picture of one of the geometric shapes mentioned in the lesson. Hold up the cards one at a time and have students say the names of the shapes.

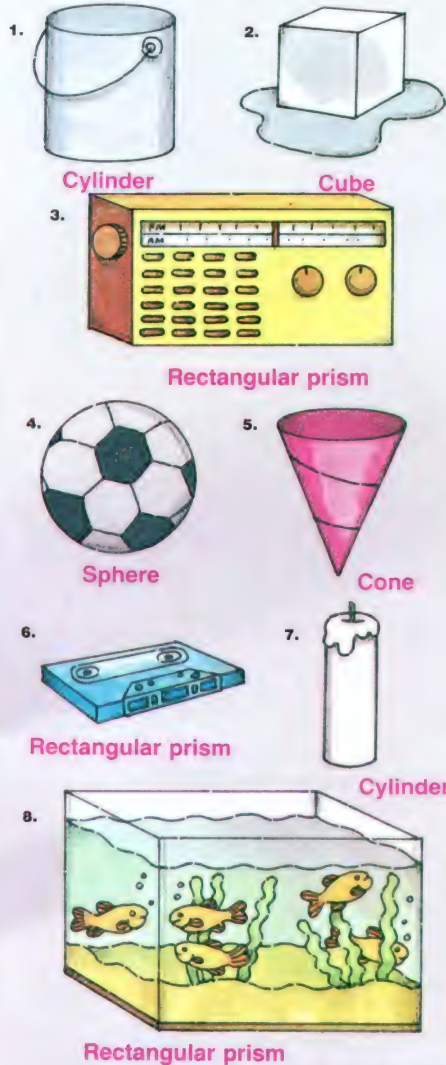
## Enrichment Using Concrete Materials

Using centimeter grid paper and the patterns below, students can make models of a cylinder and a cube.



Students can also use the patterns for a cube and a rectangular prism from the Punchouts to make models for a cube and a rectangular prism.

**Practice** Name the shape of each object. Use *rectangular prism*, *cube*, *cylinder*, *cone*, or *sphere*.



More Practice Set 76, page 379 205

## Enrichment 76

**Let's Face It** E76

The flat sides of a three-dimensional figure are called **faces**.

This face is a square. This face is a rectangle.

Name the shape of each indicated face.

1. 2. **Triangle** 3. **Rectangle** 4. **Rectangle**

A rectangular prism has 6 faces. This rectangular prism has 2 square faces and 4 rectangular faces.

Tell how many faces of each shape these solids have.

5. Rectangular prism: **6 rectangular faces**

6. Triangular prism: **3 rectangular faces, 2 triangular faces**

7. Pentagonal prism: **5 rectangular faces, 2 pentagonal faces**

## Additional Resource 76

**Calculator Figuring Costs** Additional Resource 76

The Acme Company makes large machines. The machines are packed in crates, which are covered with a special paint. Enough paint to cover one square unit of area costs \$3. All sides and the top and the bottom of each crate are painted.

Complete the table.

A B C D E

| Crate | Number of squares to be painted | Cost per square | Cost for crate   |
|-------|---------------------------------|-----------------|------------------|
| A     | 1                               | \$3             | 2                |
| B     | 3: <b>24</b>                    | \$3             | 4: <b>\$72</b>   |
| C     | 5: <b>54</b>                    | \$3             | 6: <b>\$162</b>  |
| D     | 7: <b>14</b>                    | \$3             | 8: <b>\$42</b>   |
| E     | 9: <b>40</b>                    | \$3             | 10: <b>\$120</b> |

Use me to multiply.

## Daily Maintenance

### Choosing a computation method

Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- $9 + 6$  [15]
- $47 + 16$  [63]
- $325 + 295$  [620]
- $3,298 + 2,043$  [5,341]
- $67 + 98 + 35$  [200]
- $682 + 724 + 357$  [1,763]



## Objective 77

Find volumes by counting cubic centimeters.

### Vocabulary

Cubic centimeter, volume

### Materials

- Pattern for a Cube (Punchouts)
- Cubic centimeter blocks (Math Kit)
- Several small boxes

## Introduction

**Using Concrete Materials** Have available three different-sized open boxes with their dimensions labeled in centimeters, and a supply of cubic centimeter blocks. Introduce volume as a measure of how much something can hold. Show a cubic centimeter and explain that it is used to measure volume. Have students fill the boxes, determining the volume of each.

## Using the Pages

**Teach** If students have difficulty counting cubes they cannot see, you may wish to have blocks available so that small groups of students can work together to construct the figure shown in the example.

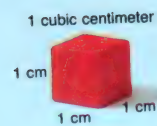
**Try** Some students may think of counting the blocks in one layer and then multiplying by the number of layers. Do not suggest this or other shortcuts, but encourage the students to discover their own.

**Practice Error Analysis** Watch for students who have difficulty counting cubic centimeters they cannot see. Have these students do the exercises using cubic centimeter blocks. (See Reteaching 77.)

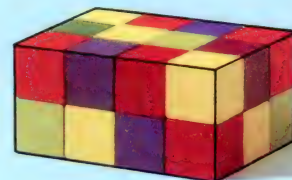
**Estimation** Show students several small boxes. Have a student fill each box with cubic centimeter blocks, and make a sign identifying the volume of the container. Then show students several other boxes and ask students to estimate the volume of each. Record the estimates and have a student find the volume of each container by filling it with cubic centimeter blocks.

## Volume

The **volume** of a three-dimensional figure is the number of cubic units inside the figure. The **cubic centimeter** is a unit of volume.



This box is a rectangular prism. To find its volume, think of filling the box with cubes. It takes 24 cubes to fill it. Each cube is 1 cubic centimeter. So the volume of the box is 24 cubic centimeters.



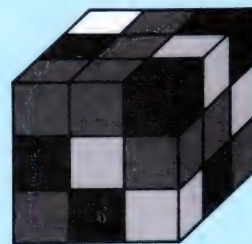
**Try** Find the volume of each figure in cubic centimeters.

a.



12 cubic centimeters

b.



27 cubic centimeters

**Practice** Find the volume of each figure in cubic centimeters.

1.



10 cubic centimeters

2.



8 cubic centimeters

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## Practice 77

Name \_\_\_\_\_

Find the volume of each figure in cubic centimeters. **P77**

- 9 cubic centimeters
- 18 cubic centimeters
- 8 cubic centimeters
- 24 cubic centimeters
- 13 cubic centimeters
- 12 cubic centimeters
- 32 cubic centimeters
- 8 cubic centimeters
- 6 cubic centimeters

## Reteaching 77

Name \_\_\_\_\_

The volume of a three-dimensional figure is the number of cubic units inside the figure. **R77**

1 cubic centimeter 24 cubic centimeters

Find the volume of each figure in cubic centimeters.

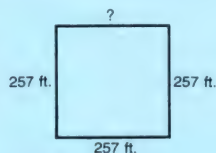
- 4 cubic centimeters
- 6 cubic centimeters
- 12 cubic centimeters
- 8 cubic centimeters
- 20 cubic centimeters
- 12 cubic centimeters



## CALCULATOR

For each figure, use your calculator to find the length that is not given.

1. Perimeter: 1,028 ft.



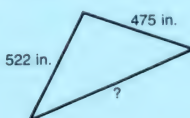
257 ft.

2. Perimeter: 922 ft.



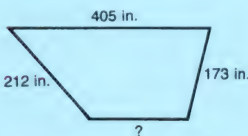
131 ft.

3. Perimeter: 1,757 in.



760 in.

4. Perimeter: 997 in.



207 in.

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1-8  |
| average  | 1-8  |
| enriched | 1-10 |

**More Practice Set 77,**  
page 379

### Calculator, page 207

Ask students questions such as: What information is given? What do you need to find? How do you plan to solve the problem? Explain that there often is more than one way to solve a problem and have students explain how they found their answers.

### Follow-Up

**Extra Practice** Give students a certain number of cubic centimeter blocks and have them see how many figures they can build having that volume. If possible, have them make drawings of the figures they make to keep count. The figures may be rectangular or irregular.

**Enrichment** You may wish to introduce the cubic inch, the cubic foot, and the cubic yard as customary units of measure for volume. Some students could build from cardboard each of the cubic units. You may wish to have students estimate how many of each of these units it would take to measure the volume of the classroom.

### Calculator

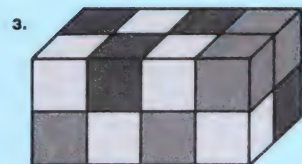
**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic, and then give reasons for their choices.

- $19 + 7 + 21 + 3$  [50]
- $2,520 + 1,140$  [3,660]
- $36 \times 43$  [1,548]
- $70 \times 90$  [6,300]
- $6,234 - 4,064$  [2,170]
- $801 - 278$  [523]
- $382 \times 47$  [17,954]

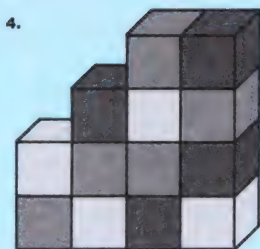
### Daily Maintenance

**Mental Math** Encourage students to find these products mentally.

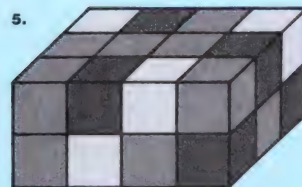
- $213 \times 40$  [8,520]
- $141 \times 30$  [4,230]
- $329 \times 30$  [9,870]
- $178 \times 50$  [8,900]
- $145 \times 80$  [11,600]
- $258 \times 40$  [10,320]
- $316 \times 60$  [18,960]
- $224 \times 90$  [20,160]



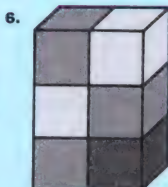
16 cubic centimeters



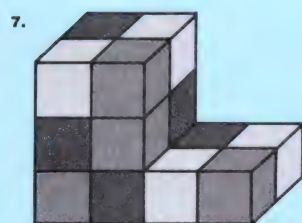
13 cubic centimeters



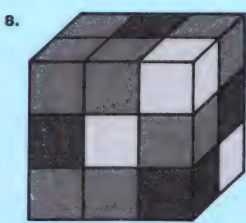
24 cubic centimeters



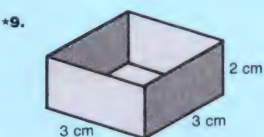
6 cubic centimeters



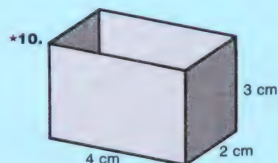
16 cubic centimeters



18 cubic centimeters



18 cubic centimeters



24 cubic centimeters

More Practice Set 77, page 379 207

## Enrichment 77

**Jigsaw II** E77

These figures are made out of blocks that represent 1 cubic centimeter ( $1 \text{ cm}^3$ ) each. Give the volume of each figure in cubic centimeters.

- $3 \text{ cm}^3$
- $4 \text{ cm}^3$
- $6 \text{ cm}^3$
- $8 \text{ cm}^3$
- $7 \text{ cm}^3$
- $9 \text{ cm}^3$
- $11 \text{ cm}^3$
- $9 \text{ cm}^3$
- $10 \text{ cm}^3$

Which two figures above fit together to make:

- figure 5? 1, 2
- figure 6? 1, 3
- figure 9? 1, 5
- figure 8? 1, 3
- figure 7? 1, 4 or 2, 5

## Additional Resource 77

**Calculator Building Cube Towers** Additional Resource 77

Find the total number of cubes in the towers below by using me to multiply.

Harnet was building a cube tower. First she built the base. It looked like this:

1. The base has 12 cubes.

Harnet's tower was 6 layers tall. Each layer was the same size. Use your calculator and write the sequence of keys to find the total number of cubes in her tower.

2. 6  $\times$  12  $=$  72 cubes

Find the total number of cubes in these towers:

- 4 layers of 12 cubes each 4  $\times$  12  $=$  48 cubes
- 8 layers of 14 cubes each 8  $\times$  14  $=$  112 cubes
- 10 layers of 8 cubes each 10  $\times$  8  $=$  80 cubes
- 52 layers of 12 cubes each 52  $\times$  12  $=$  624 cubes
- 61 layers of 14 cubes each 61  $\times$  14  $=$  854 cubes



## Chapter 7 Test

An acceptable score for each objective is suggested on the Chapter 7 Form for Individualizing.

If any reteaching is necessary, refer to the following pages.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| 66        | 1, 2       | 182–183    |
| 67        | 3, 4       | 184–185    |
| 68        | 5          | 186–187    |
| 69        | 6, 7       | 188–189    |
| 70        | 8, 9       | 190–191    |
| 71        | 11, 12     | 192–193    |
| 72        | 13, 14     | 194–195    |
| 73        | 15         | 198–199    |
| 74        | 16–18      | 200–201    |
| 75        | 10         | 202–203    |
| 76        | 19         | 204–205    |
| 77        | 20         | 206–207    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 20             | 100 | 14             | 70 |
| 19             | 95  | 13             | 65 |
| 18             | 90  | 12             | 60 |
| 17             | 85  | 11             | 55 |
| 16             | 80  | 10             | 50 |
| 15             | 75  |                |    |

### Additional Ideas for Evaluation

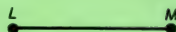
See pages 464–467.

### Record Form

- Class Test Record Form
- Student Test Record Form
- Chapter 7 Form for Individualizing
- Cumulative Record Folder

## Chapter 7 Test

1. Name the segment.  
**Segment LM**



2. Are the lines parallel or intersecting?  
**Intersecting**



3. Name the angle.  
**Angle XYZ**



For Exercises 4–10, answer the question by writing yes or no.

4. Is the angle a right angle?  
**No**



5. Is the figure a polygon?  
**No**



6. Are the segments congruent?  
**Yes**



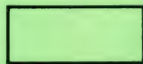
7. Are the polygons congruent?  
**No**



8. Is the polygon a parallelogram?  
**Yes**



9. Is the polygon a rectangle?  
**Yes**



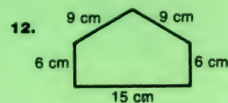
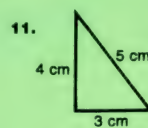
10. Is the broken line a line of symmetry?  
**No**



208

## 14. 3 square centimeters

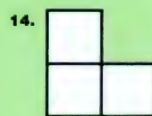
Find the perimeter of each figure.



45 cm

12 cm

Find the area of each figure in square centimeters.



See above.

6 square centimeters



4 square centimeters

Use the circle for Exercises 16–18.

16. Name the center.

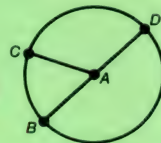
**Point A**

17. Name a radius.

**Segment AC, AD, or AB**

18. Name a diameter.

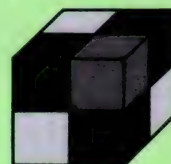
**Segment BD**



19. Is the figure a sphere, cone, or cylinder?  
**Cone**



20. Find the volume of this figure in cubic centimeters.



8 cubic centimeters

## Chapter 7 Letter Home

**Keeping You Posted**

We have completed the chapter on geometry in our mathematics textbook. This chapter included finding the distance around and the area of a figure. For practice, you might ask your child to measure the distance around a room in your home and find its area. The next chapter covers division facts through 81 ÷ 9.

To: Family

Give the area of each shape in square centimeters.

1 cm

1.

10 square centimeters

2.

6 square centimeters

3.

10 square centimeters

4.

11 square centimeters

5.

6 square centimeters

6.

8 square centimeters

107

## Chapter 7 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Posttest Chapter 7**

**Line AB or BA**

1. Name the line.

2. Are the lines parallel or intersecting?

3. Name the angle.

4. Is this angle a right angle?

5. Is this figure a polygon?

6. Are these segments congruent?

7. Are these polygons congruent?

8. Is this polygon a parallelogram?

9. Is this polygon a rectangle?

10. Is the broken line a line of symmetry?

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

37

Name \_\_\_\_\_

**Posttest Chapter 7**

**continued**

Find the perimeter of each figure.

11.

12.

Find the area of each figure in square centimeters.

13.

14.

15.

Use the circle for Exercises 16–18.

16. Name a radius.

17. Name the center.

18. Name a diameter.

19. Is the figure a sphere, cone, or cylinder?

20. Find the volume of this figure in cubic centimeters.

11.

12.

13.

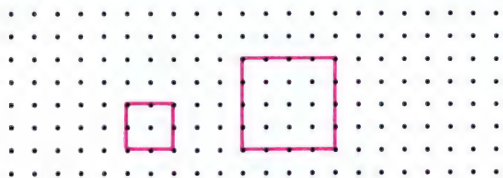
38



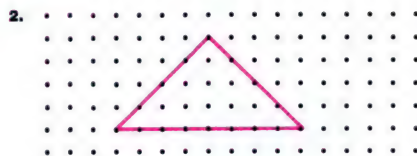
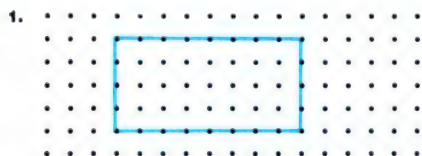
# CHALLENGE

## Drawing Similar Figures

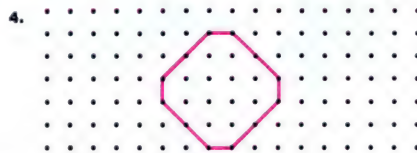
Figures that have the same shape are *similar figures*. Similar figures may differ in size. In the similar figures shown below, each side of the large figure is twice as long as the corresponding side of the small figure.



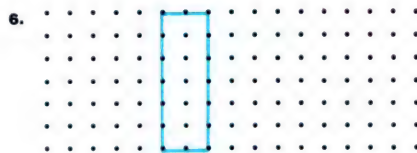
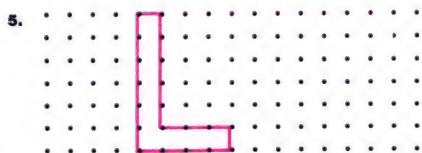
For each exercise, copy the figure. Then draw a similar figure with sides twice as long. **See margin.**



For each exercise, copy the figure. Then draw a similar figure with sides three times as long. **See margin.**



For each exercise, copy the figure. Then draw a similar figure. **Answers will vary.**



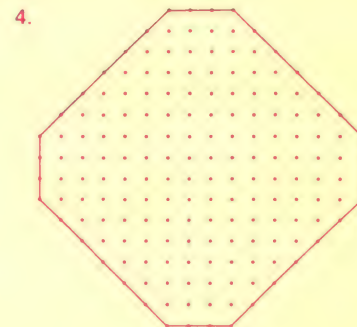
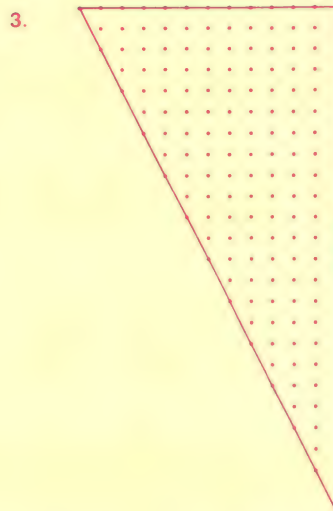
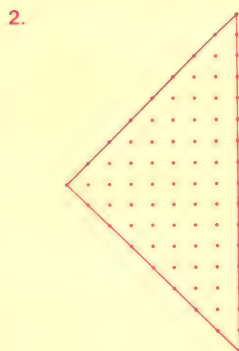
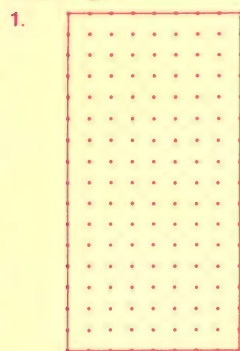
209

## Challenge

**Draw a picture** To best discuss this example, use it with an overhead projector. Point out that *each* side of the large square corresponds to a side of the small square and is twice as long. In Examples 5 and 6, make sure students understand that each side of the larger figure they draw must correspond to the smaller figure shown in the exercises. Answers will vary because some students may choose to make each side twice as long while others opt for making each side three, four, or five times as long as the figure shown.

Answers, page 209

## Challenge





## Using Problem-Solving Strategies

- Draw a picture.
- Find a pattern.

### Materials

- Graph paper

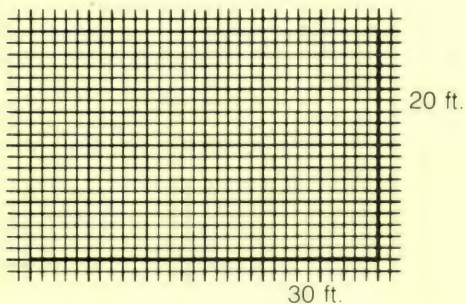
### Introduction

Students look at several different rectangles with the same perimeter and find their areas. They should observe how lengthening or shortening the sides changes the area. The areas can be found by multiplying or by counting squares on graph paper.

### Using the Page

Students will find that there is 300 ft. of wire. Since the fence is to have 3 strands of wire, Mr. Jensen can make 100 ft. of fence. [The perimeter of the barn lot will be 100 ft.]

Have the students *draw a picture* on graph paper to help them think about Problem 2.



When the width is 20 ft., it will also be 20 ft. on the opposite side. That allows 60 ft. of fence for the other 2 sides, so each of them must be 30 ft. long. [The length will be 30 ft.]

Have the students count the squares inside the rectangle to find the area. Some will see that they can get this result more quickly by multiplying.

Use the same method to find answers to Problem 3.

To answer Problem 4, have the students find the areas of other rectangles with a 100 ft. perimeter. For example: 35 ft. long, 45 ft. long, 25 ft. long, and 28 ft. long.

[35 ft.  $\times$  15 ft., Area = 525 sq. ft.]

[45 ft.  $\times$  5 ft., Area = 225 sq. ft.]

[25 ft.  $\times$  25 ft., Area = 625 sq. ft.]

[28 ft.  $\times$  22 ft., Area = 616 sq. ft.]

Students can *find a pattern*. Notice from the examples that when the length is much greater than the width, the area is less. When the length and width are nearly the same, the area is greatest.

The area will be greatest when the length is the same as the width. [The cows will have the most room inside the lot when it is shaped like a square.]

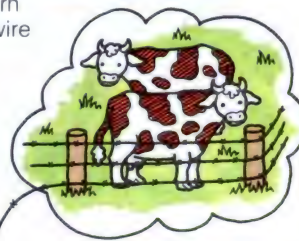
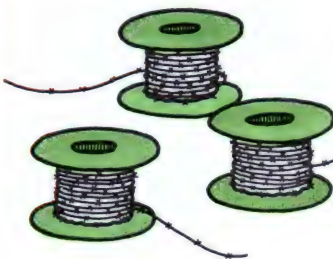
## Using Problem-Solving Strategies

# JENSEN'S FENCE

Mr. Jensen plans to fence in a rectangular barn lot for his cows. He plans to make a barbed-wire fence that has 3 strands of wire.

He has 3 partly-used rolls of barbed wire and plans to use all of the wire for his fence. He wants to fence in the largest lot possible.

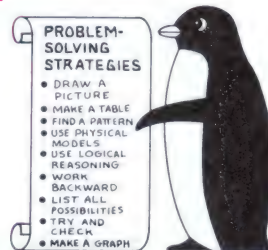
One roll of wire has 112 feet. The second roll has 64 feet, and the third roll has 124 feet of wire.



1. What will be the perimeter of the barn lot? **100 ft.**
2. If the lot is 20 feet wide, what will be its length? **30 ft.** its area? **600 sq. ft.**
3. If the lot is 40 feet long, what will be its width? **10 ft.** its area? **400 sq. ft.**
4. How should the lot be shaped to have as much room inside as possible?

**25 ft. on each side of a square Area = 625 sq. ft.**

210



### PROBLEM-SOLVING STRATEGIES

- DRAW A PICTURE
- MAKE A TABLE
- FIND A PATTERN
- USE PHYSICAL MODELS
- USE LOGICAL REASONING
- WORK BACKWARD
- LIST ALL POSSIBILITIES
- TRY AND CHECK
- MAKE A GRAPH

This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 404



# chapter 8

## Division Facts

### Mathematical Background

**Division Concepts** There are two principal models for division. For example, consider the problem  $24 \div 6$  and two ways of presentation:

1. Suppose there are 24 marbles and 6 containers. If each container is to have the same number of marbles, how many are in each?
2. Suppose there are 24 marbles. If 6 marbles each are put into several containers, how many containers are there?

The first problem calls for an equal distribution among many. In this type of activity, children have a fixed amount of money and must "divide" the money equally. The second problem suggests an activity such as determining how many cars are needed to take a fixed number of children on a field trip.

The answers to both types of problems can be checked by multiplication. The number of marbles per container times the number of containers should be 24. It is important that students understand this inverse relationship between multiplication and division.

Multiplication and division should be taught concurrently. For example,  $35 \div 7 = 5$  because  $5 \times 7 = 35$ . When this relationship is understood, it offers justification for why 0 cannot be used as a divisor:

If  $7 \div 0 =$  a number (such as 7), then  $0 \times 7 = 7$ , which is not true.

**Remainders** Suppose there are 25 marbles and 6 containers. If the same number of marbles are put into each container, there will be 1 marble left over (the remainder). The same answer is arrived at, using the second model.

To check such a problem, multiply the number of containers (6), and the number of marbles per container (4), then add to that the number of marbles left over.

Note that the remainder may be 0, if none are left. However, if the answer (4, in this case) is correct, the remainder will *never* be greater than or equal to the divisor in the original problem (in this case, 6).

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### Pretest for Chapter 8

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 8**

Complete each division sentence.

1. 16 in all.  
How many groups of 4?  
  
 $16 \div 4 = \underline{\quad}$
2. 21 in all.  
7 equal groups.  
How many in each group?  
  
 $21 \div 7 = \underline{\quad}$

Divide.

|                        |                        |
|------------------------|------------------------|
| 3. $2 \overline{)16}$  | 4. $3 \overline{)18}$  |
| 5. $4 \overline{)12}$  | 6. $5 \overline{)15}$  |
| 7. $4 \overline{)10}$  | 8. $1 \overline{)7}$   |
| 9. $6 \overline{)15}$  | 10. $7 \overline{)42}$ |
| 11. $8 \overline{)16}$ | 12. $9 \overline{)36}$ |
| 13. $8 \div 2$         | 14. $24 \div 3$        |
| 15. $32 \div 4$        | 16. $10 \div 5$        |
| 17. $0 \div 8$         | 18. $3 \div 1$         |
| 19. $30 \div 6$        | 20. $14 \div 7$        |
| 21. $40 \div 8$        | 22. $9 \div 9$         |

1. 4 groups

2. 3 in each group

3. 8

4. 6

5. 3

6. 3

7. 0

8. 7

9. 9

10. 6

11. 2

12. 4

13. 8

14. 8

15. 2

16. 0

17. 3

18. 5

19. 2

20. 5

21. 1

15

Name \_\_\_\_\_

**Pretest Chapter 8**

Write a family of facts using the given numbers.

23. 4 9 36

$9 \times 4 = 36$   
 $4 \times 9 = 36$   
 $36 \div 4 = 9$   
 $36 \div 9 = 4$

Divide.

24.  $8 \overline{)67}$     25.  $5 \overline{)39}$     26.  $4 \overline{)27}$

24. 8 R3  
 25. 7 R4  
 26. 6 R3

Solve each problem.

27. Joan had 15 pennies. She gave 6 pennies to her brother and 3 more to her sister. How many pennies did Joan have left?  
6 pennies

28. 14 children were playing. 4 children left. The remaining children made 2 equal teams. How many children were on each team?  
5 children

Tell whether you add, subtract, multiply, or divide. Then find the answer.

29. Jon made a pattern with marbles. He put 5 marbles in each of 15 rows. How many marbles did he use in all?  
Multiply 75 marbles

30. A florist had 56 flowers. He put 8 flowers in each vase. How many vases did he use?  
Divide 7 vases

16



## Teaching Chapter 8

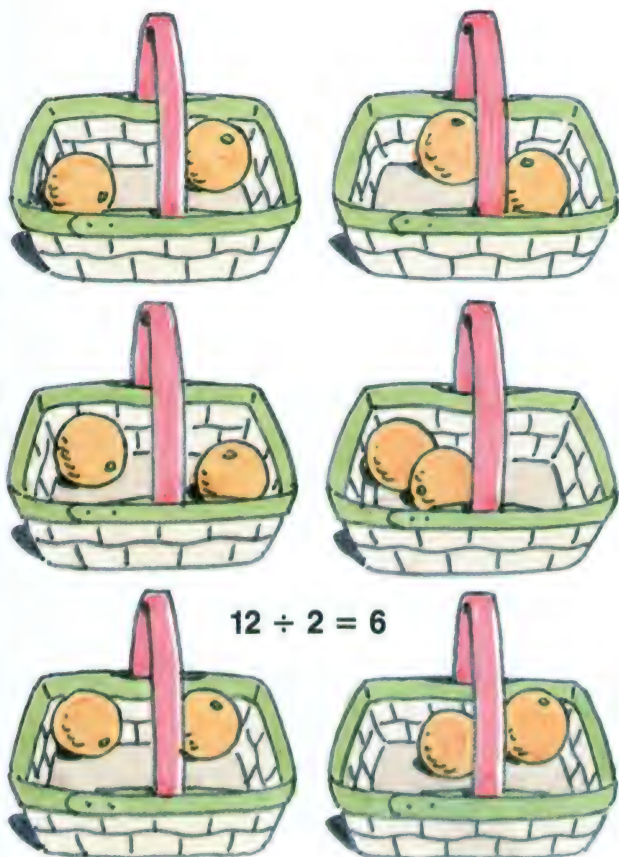


## Problem Solving

**Five-Step Method** Earlier chapters have provided the practice necessary to tackle the more difficult problems introduced in this chapter—the multiple-step problems requiring two or more operations to answer. Multiple-step problems focus on the PLAN step by requiring students to choose the operation(s) needed to solve the problem.

**Problem-Solving Strategies** The nonroutine problems in the *Using Problem-Solving Strategies* feature on pages 232–233, 240, 424, and 425, and **Math Poster GG** provide opportunities for students to use the strategies *Use physical models*, *Use logical reasoning*, *Draw a picture*, *List all possibilities*, *Make a table*, and *Try and check*.

It is especially important for students to understand that multiple-step problems are naturally perplexing. However, through practice with rereading the problem, discussing it, trying different strategies, and finding solutions, they'll learn that their confusion is normal and will pass.



$$12 \div 2 = 6$$

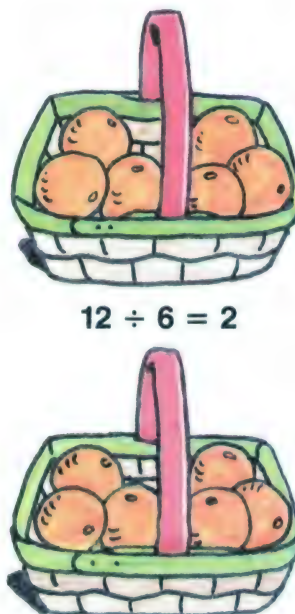


## Calculators and Computers

**Calculators** A calculator may be used to enhance the introduction of any operation. This is especially true of division. In Chapter 5, students used a calculator to see that multiplication may be thought of as repeated addition. In this chapter, students see that division can be thought of as a process of repeated subtraction. If students have calculators with a constant function, you can show the students how to key  $24 \square 8 \square \square \square$  and count the number of times the  $\square$  button is pushed before 0 appears in the display. Then students use a calculator and repeated subtraction to find a remainder.

In the calculator activity on page 231 in the teacher's notes, students find missing digits in multiplication problems involving two 3-digit numbers. You might ask children such questions as, "If  $54? \times ?27 = 339,207$ , how can you find the digit that should follow the 4 in 54??" "Which 7 fact has 7 in the ones digit?" ( $7 \times 1 = 7$ ) "How can you find the missing digit in  $?27$ ?" Suggest that they first estimate  $500 \times ?00 = 300,000$ . Then students can try and check to find the answers.

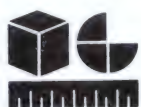
**Computers** The computer activities in this chapter introduce the symbol  $\div$  for division. Students gain experience in using BASIC programs that perform division calculations. **Additional Resource 87** introduces the use of the comma in PRINT statements, to produce output in column form.



$$12 \div 6 = 2$$

Understanding the meanings of the operations can help students become better problem solvers.





## Concrete Materials

In this chapter it would be good to concentrate on the use of the three-stage approach to learn the division facts. Be sure that students work first with plenty of concrete materials. Then have them work with pictures of objects and arrays of dots. Only when students have a very good understanding of the concept, should they work with the numbers.

It is important to stress that each division fact can represent two different division situations. Students will need to find either the number of items in each group, or the number of groups that can be made. For example:  $12 \div 6 = 2$  can be interpreted as, "If 12 oranges are divided into 6 equal groups, there are 2 in each group." Another interpretation is, "If 12 oranges are divided into groups of 6, there are 2 groups." Having students use counters or other objects to learn this concept is important.

It is also important to have students work with numbers which are not evenly divisible. For example, Merikay has 23 guppies. She wants to put the same number of guppies into each of 4 tanks. How many guppies can she put into each tank? Have students tell the number of groups [4], and then separate 23 counters into 4 groups [5 in each group with 3 left over].



## Thinking Skills

In this chapter, students **recall factual knowledge** as they practice basic facts. Note the many pictures of arrays to help students **comprehend concepts** related to the meaning of division. Students **apply concepts** to solve multiple-step problems. The *Using Problem-Solving Strategies* pages and the Situational Lesson on page 211 require students to **analyze relationships**. Note that the Thinking Skills exercise on page 215 leads students to **make a generalization** related to divisibility.



## Teaching Techniques

**Questioning and Responding** Some students will have rapid recall of basic facts and others may be slower. When you ask the whole class for the answer to a basic fact, pause before calling on a particular student, so that all the students will have time to think of an answer.

When you call on students to answer questions in class, be careful about treating the bright students differently than the others. If you call on bright students too often, the other students will feel less responsibility to participate. Also, notice whether you give brighter students a longer time to respond, since you know they can do it, and whether you give up too quickly when a slower student doesn't have the answer right away.

**Helping Students Read and Write Mathematics** As students read the word problems in this chapter, they may realize that multiplication and division problems sound similar. To help the students, have them reread the problems and restate them in their own words. When students write division basic facts, have them practice translating back and forth from the  $6 \div 2$  form to the  $2\overline{)6}$  form.

**Teaching Students with Special Needs** You may wish to pose the following questions to your gifted students as a way of reinforcing division facts while providing some problem-solving practice: If you have 10 coins (or cards, chips, and so on), can you divide them into equal piles? How many different ways? Can you divide them so that no pile will have the same number of coins as another pile? How can you do this? For which other number of coins between 11 and 30 can you also do the same? For which numbers of coins between 40 and 65? What happens to the answers if you can make no more than 4 piles of coins?

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

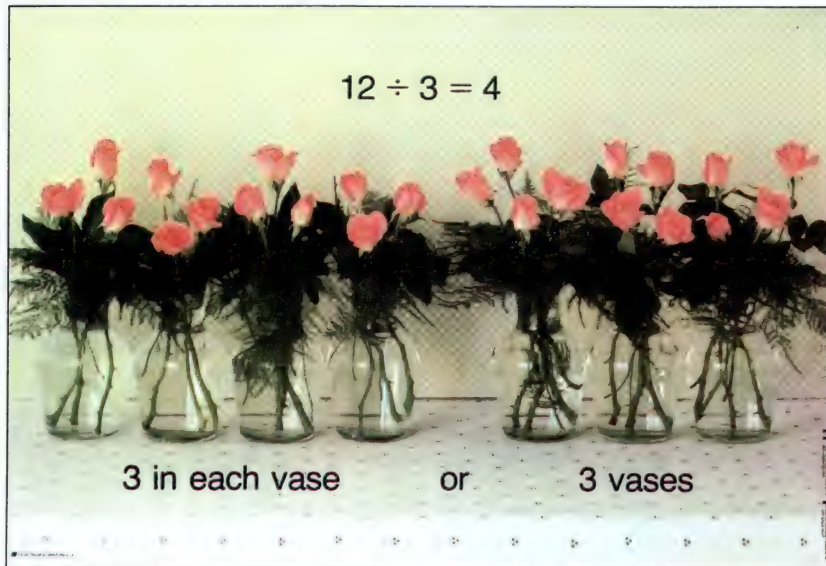
**Art:** crayons (212–213), projects (214–215), paint (216–217), paintbrushes (218–219)

**Social Studies:** wampum (222–223), ships (224–225), Spanish gold coins (226–227)

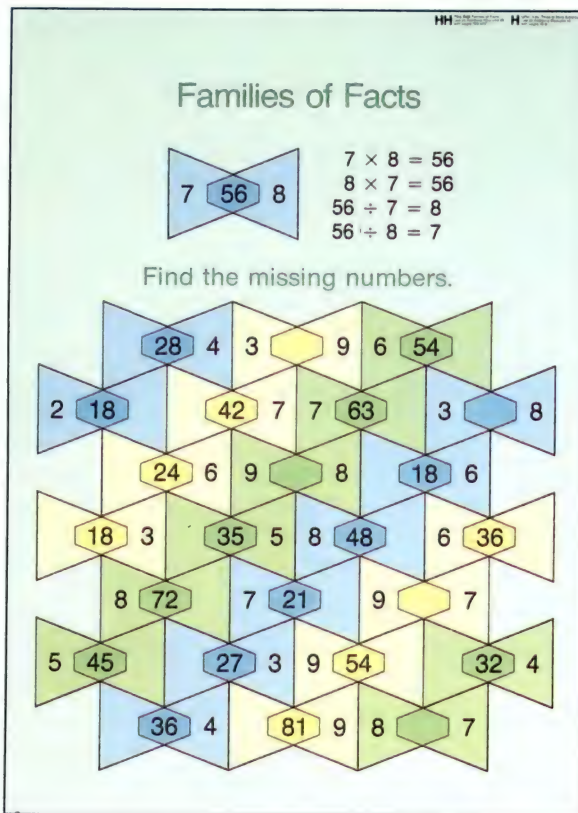


## Bulletin Board Suggestions

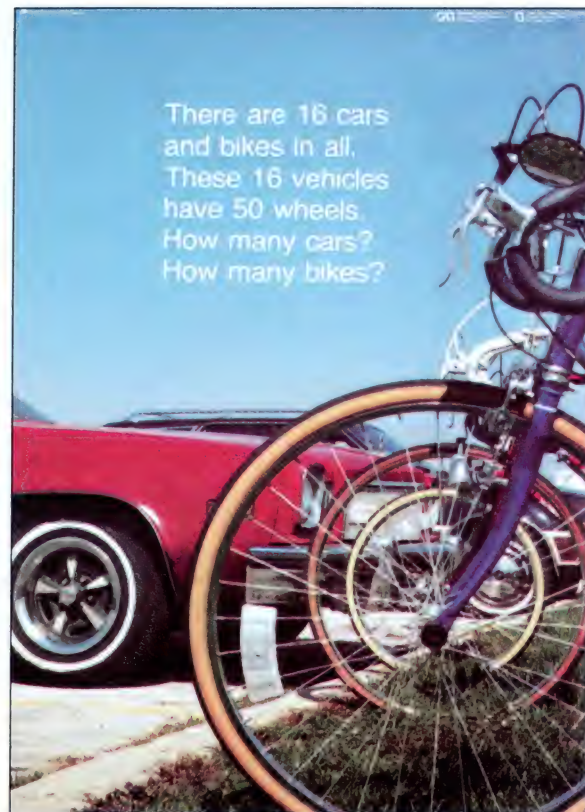
The posters shown here can be used with Chapter 8. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster FF



Math Poster HH



Math Poster GG

## Materials Chapter 8

- Counters (Punchouts) 212–215, 234–237
- Tens, units (Punchouts or Math Kit) 214–225, 228–229, 236–237
- Flashcards (Division Facts) 218–219
- Division fact sheets 220–221
- Answer sheets 220–221
- Money (Punchouts) 226–227
- Classroom objects 226–227
- Common objects 230–231
- Calculator 232–233
- Sets of 4 cards with operation signs 236–237



## Basic Situation

Display Poster FF and ask students to discuss what is shown in the poster. [24 roses, 12 grouped in 4 sets of 3 and 12 grouped in 3 sets of 4] Ask if the 24 roses could be evenly distributed among some vases so that there are at least 3 roses in each vase and at least 2 vases. [2 vases with 12 each, 3 vases with 8 each, 4 vases with 6 each, 8 vases with 3 each]

Next ask students to identify possible ways of grouping students within a classroom for the purpose of creating teams for competition or for sharing materials for art or science projects.

## Possible Problems

- What constitutes a group or team of students? Can a group be the whole class or only one student? Should there be a maximum or minimum group size?
- Must each group be the same size, or for some activities can groups differ by one or more students?
- What are some activities for which the number of groups is important?

## Indicators of Success

Students may decide that groups for sharing art or science materials need not be the same size, but should differ by only one or two students, while teams for a contest should be the same size.

Some students will notice whether or not the class size is a multiple of 2, 3, or 4. These are important observations and should be encouraged.

Some students may divide to determine whether groups of equal size can be formed. Watch for students who realize that  $28 \div 5 = 5 \text{ R}3$ , for example, indicates that it is possible to form 5 groups of five students each. The remainder 3 indicates that if all students are included in a group, two groups will have five students and three groups will have six students.

## Ways to Help

Some students may need to review the basic multiplication facts, or to make a list of the multiples of 2, 3, 4, and so on.

If students cannot get started, encourage them to look at multiples of numbers rather than division of numbers.

$$\begin{array}{r} 3 \\ 3 \overline{)9} \end{array}$$

In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

## Possible Results

A class of 28 students decides that a group must be at least 2 students and that there can be no fewer than 2 groups. The groups must be of the same size. If everyone is present, then there could be:

- 2 groups of 14 children
- 4 groups of 7 children
- 7 groups of 4 children
- 14 groups of 2 children

This list shows the importance of knowing multiplication facts.

In the above class, if one student is absent, then the list becomes much shorter.

- 3 groups of 9 children
- 9 groups of 3 children

If in the same class of 28 students, the class decides that each group must have at least 3 students, and that no group can differ from another by more than one student, then the possibilities are:

- 3,3,3,3,3,3,3,4
- 4,4,4,4,4,4,4
- 5,5,6,6,6
- 7,7,7,7
- 9,9,10
- 14,14

With 27 students, the possibilities are:

- 3,3,3,3,3,3,3,3
- 3,3,3,3,3,4,4,4
- 4,4,4,5,5,5
- 5,5,5,6,6
- 6,7,7,7
- 9,9,9



## Objective 78

Write a division equation to show the number in each group or the number of groups.

### Lesson Theme

Art: Crayons

### Vocabulary

Divisor, quotient

### Materials

- Counters (Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Have students multiply the following.

- $2 \times 7$  [14]
- $3 \times 6$  [18]
- $4 \times 9$  [36]
- $3 \times 5$  [15]
- $4 \times 3$  [12]
- $2 \times 0$  [0]

## Using the Pages

### Teach Using Concrete Materials

Discuss the examples with students after they have tried them on their own. In Example A, they should realize that since each student needs three crayons, finding how many groups of 3 can be made from 24 counters determines how many students can do the project.

In Example B, emphasize that students must separate their counters into 3 groups that have the same number of counters in each group. Discuss with students what 8 represents in each example. [Example A, how many groups; Example B, how many in each group.]

For Example C, have students show that 24 can also be divided into 6 groups of 4 and 4 groups of 6.

**Reading and Writing Mathematics** In Example D, discuss the division sentence and the terms *quotient* and *divisor*.

In Example E, students are shown how to use a related multiplication fact to help them with a division basic fact. Encourage students to use this strategy often.

**Try** After reading each exercise, ask students whether they need to find how many groups or how many in each group.

### Apply Problem Solving

**Draw a picture** For Problems 10–13, explain to students that they need to determine whether they are to find how many groups or how many in each group. Point out that their pictures should show this for each problem.

**Estimation** Show students a shoe box and pose the following problem to the students. How many crayons do you think will fit in this box? Let's discuss ways to find an estimate without actual. (Continued on page 213.)

## Meaning of Division See Using the Pages for a discussion of these examples.

Work with another student.

Each of you will need your counters.

- A.** Ms. MacDonald is an art teacher. Each student in her class needs 3 crayons for an art project. How many students can do the project if she has 24 crayons?

Count out 24 counters to represent the crayons. Use them to show how many groups of 3 are in 24.

There are  groups of 3 in 24. **8**

 students can do the project. **8**

- B.** Her 24 crayons fit into 3 boxes with the same number in each box. How many crayons are in each box?

Use your counters to show 24 separated into 3 equal groups. How many are in each group?

There are 3 groups of  in 24. **8**

There are  crayons in each box. **8**

Compare what you did in Example A with what you did in Example B. What does this show? **Both examples show 24 divided by 3. Example A shows 24 as 8 groups of 3 and Example B shows 24 as 3 groups of 8.**

- C.** Each of you use 24 counters. One of you separate the counters into groups of 4, while the other separates his or her counters into 4 equal groups. Explain what this shows. **Both show 24 divided by 4. The first student shows 24 as 6 groups of 4 and the second one shows 24 as 4 groups of 6.**

- D.** You can write a division sentence to show that 24 divided by 3 is 8.

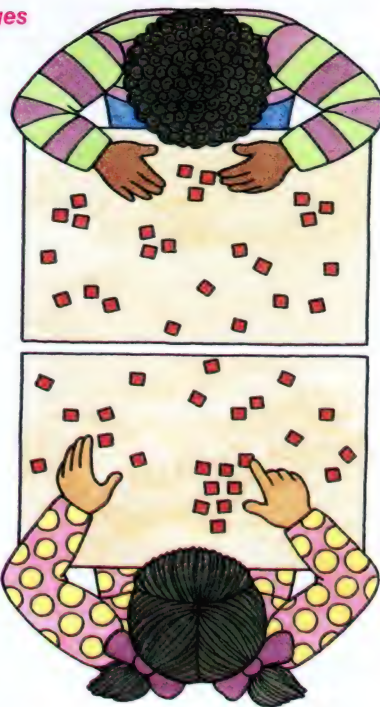
$$24 \div 3 = 8$$

Divisor      Quotient

Write a division sentence for Example C.

$$24 \div 4 = 6$$

212



## Practice 78

Name \_\_\_\_\_ P78

Find how many groups. Then complete each division sentence.

- 12 in all  
Groups of 3  
 $12 \div 3 = \underline{4}$
- 18 in all  
Groups of 3  
 $18 \div 3 = \underline{6}$
- 15 in all  
Groups of 5  
 $15 \div 5 = \underline{3}$
- 24 in all  
Groups of 6  
 $24 \div 6 = \underline{4}$
- 16 in all  
Groups of 4  
 $16 \div 4 = \underline{4}$
- 14 in all  
Groups of 2  
 $14 \div 2 = \underline{7}$

Find how many in each group. Then complete each division sentence.

- 25 in all  
5 equal groups  
 $25 \div 5 = \underline{5}$
- 28 in all  
7 equal groups  
 $28 \div 7 = \underline{4}$
- 27 in all  
3 equal groups  
 $27 \div 3 = \underline{9}$
- 21 in all  
7 equal groups  
 $21 \div 7 = \underline{3}$
- 24 in all  
8 equal groups  
 $24 \div 8 = \underline{3}$
- 18 in all  
9 equal groups  
 $18 \div 9 = \underline{2}$

## Reteaching 78

Name \_\_\_\_\_ R78

There are 15 stars in all. They are in groups of 3. How many groups of 3 in 15?  
 $15 \div 3 = \underline{5}$

There are 5 groups of 3 in 15.  
 $15 \div 3 = \underline{5}$

Complete each division sentence.

- 8 rockets in all  
Groups of 4  
 $8 \div 4 = \underline{2}$
- 6 shooting stars in all  
Groups of 2  
 $6 \div 2 = \underline{3}$
- 9 spaceships in all  
Groups of 3  
 $9 \div 3 = \underline{3}$
- 16 helmets in all  
Groups of 4  
 $16 \div 4 = \underline{4}$
- 18 moons in all  
3 equal groups  
 $18 \div 3 = \underline{6}$
- 10 suns in all  
2 equal groups  
 $10 \div 2 = \underline{5}$
- 18 space boots in all  
9 equal groups  
 $18 \div 9 = \underline{2}$



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1-13 |
| average  | 1-13 |
| enriched | 1-13 |

**More Practice Set 78,**  
page 380

(Continued from page 212.)

ly filling the box. [1. Put one layer of crayons on the bottom and stack some up along the side. Lead students to see that they could multiply the number in one layer by the number of layers needed to fill the box. 2. Place equal-size boxes of crayons in the shoe box and multiply by the number of crayons in each box. Add on some extras to account for the space taken up by the boxes.]

## Follow-Up

### Reteaching Using Concrete Materials

Have students work in pairs to arrange assorted objects into equal groups. Have students write a division number sentence for each grouping. Encourage the students to find alternate ways of grouping the same number of objects.

### Computer Assisted Instruction

Mathematics Courseware Series

• Division 1, Activity 1

### Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic, and then give reasons for their choices.



1.  $2,408 - 267$  [2,141]
2.  $915 \times 64$  [58,560]
3.  $87 - 33$  [54]
4.  $83 \times 40$  [3,320]
5.  $231 + 896 + 425$  [1,552]
6.  $14 + 25 + 6 + 30$  [75]

### Daily Maintenance

1.  $439 - 59$  [380]
2.  $367 - 81$  [286]
3.  $796 - 307$  [489]
4.  $628 - 136$  [492]
5.  $436 - 263$  [173]

### Answers, page 213


a.-b. Samples are given.

- a.  b. 


Answers are continued on page 239 of this Teacher's Edition.

**Try** Use counters to complete each division sentence. Then make a sketch of your counters that shows the division sentence. **See margin.**

a. 12 in all  
How many groups of 4?  
 $12 \div 4 = 3$  

b. 18 in all  
How many in each of 9 equal groups?  
 $18 \div 9 = 2$  


**Practice** Use counters to show how many groups. Then complete each division sentence. **See margin.**

1. 32 in all  
Groups of 8  
 $32 \div 8 = 4$  

2. 21 in all  
Groups of 7  
 $21 \div 7 = 3$

3. 15 in all  
Groups of 3  
 $15 \div 3 = 5$

Use counters to show how many in each group. Then complete each division sentence. **See margin.**

4. 20 in all  
4 equal groups  
 $20 \div 4 = 5$  

5. 14 in all  
2 equal groups  
 $14 \div 2 = 7$

6. 25 in all  
5 equal groups  
 $25 \div 5 = 5$

Use counters to complete each division sentence.

7.  $42 \div 3 = 14$

8.  $48 \div 4 = 12$

9.  $36 \div 18 = 2$

**Apply** Make a sketch and write a division sentence for each problem. **See margin.**

Mr. Reel went fishing with two friends. He bought a can of worms at a bait store. There were 63 worms in the can.

10. The fishermen shared the worms. Mr. Reel put the worms into 3 equal groups. How many worms were in each group?  
**21 worms;  $63 \div 3 = 21$**

11. One of the other fishermen wanted to put the worms into groups of 3. How do you think he planned to distribute the worms? Explain your thinking. How many worms would each fisherman get using this method?

**See margin.**

Mr. Johanson plans to share a box of chalk equally with his art students. There are 36 pieces of chalk.

12. There are 12 students in class. How could he share the pieces of chalk?

**Give each student 3 pieces;  
 $36 \div 12 = 3$**

13. Four pieces of chalk are needed for an art project. How many of his students can do the project?


**9 students;  $36 \div 4 = 9$**

More Practice Set 78, page 380 213

## Enrichment 78

Name \_\_\_\_\_ E78

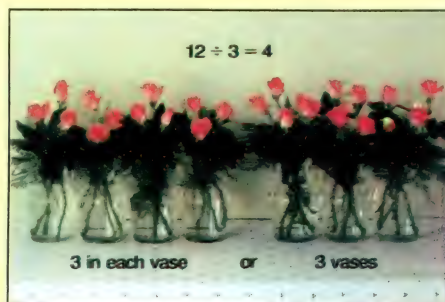
**Compound Zebra**



Zoo animals live in small groups in enclosed areas called compounds. The table shows how a zoo grouped some of the animals. Complete the table.

| Animals   | Total number | Number in each compound | Number of compounds |
|-----------|--------------|-------------------------|---------------------|
| Tigers    | 6            | 2                       | 3                   |
| Bears     | 12           | 4                       | 3                   |
| Wolves    | 24           | 12                      | 2                   |
| Zebras    | 30           | 6                       | 5                   |
| Elephants | 8            | 2                       | 4                   |
| Monkeys   | 15           | 5                       | 3                   |
| Ostriches | 21           | 3                       | 7                   |
| Cougars   | 5            | 1                       | 5                   |
| Gazelles  | 4            | 4                       | 1                   |
| Foxes     | 18           | 3                       | 6                   |

## Additional Resource 78



### Math Poster FF Meaning of

**Division** Use this poster as a teaching display to help students understand the meaning of division. See Answer Key for suggested activities.



## Objective 79

Write quotients for division facts using 2 or 3 as the divisor.

### Lesson Theme

Art: Projects

### Materials

- Tens, Units (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Pose the following problem to the students. How can we find out how many pairs of students are in the classroom? [Line up two by two and count by twos. (If there is an odd number of students in class, let one student be the counter.)] How many students would be in each of two equal groups? Some students may see that the number of pairs will also be the answer to how many in each group. Otherwise, let them separate, one by one into two groups and count. Repeat, having students form groups of 3 and telling how many would be in 3 groups.

**Warm-Up Review** Use flashcards to review the multiplication basic facts for 2 and 3.

## Using the Pages

**Teach** Read and discuss Example A. Remind students to think: "What number times 2 is 6?" Read and discuss Example B. Note that the same division equation is used for both examples. Emphasize that 2 is the *divisor* and 3 is the *quotient*. Read and discuss Examples C and D.

**Try** Remind students to think of the related multiplication fact for each exercise.

**Apply Problem Solving** Have a student restate each problem in his or her own words before students attempt to solve these problems.

**Use logical reasoning** In Problem 35 students must realize Kiyoko is separating the brushes into 2 groups, one for Marsha and one for herself.

**Solve a simpler problem** Students should be familiar with the terms one half and one third. Ask how many groups students would make if they wanted to find one half of 2 objects. [2] Then ask how many would be in each group. [1] Increase the number of objects by two until they get to 12. Do the same for one third. Students should come to see that to find one half, divide by 2, and to find one third, divide by 3.

## Dividing by 2 and 3

There are 6 students in art class.



- A. How many groups of 2 are there?

$$6 \div 2 = 3 \quad 3 \times 2 = 6$$

There are 3 groups of 2 in 6.



- B. How many students are in each of 2 equal groups?

$$6 \div 2 = 3 \quad 2 \times 3 = 6$$

There are 3 students in each of 2 equal groups.

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## Practice 79

Name: \_\_\_\_\_

Solve each problem.

1. Alice saw 15 trees in groups of 3. How many groups were there?  
5 groups of trees

2. 16 guests were at the party. They sat at tables in groups of 2. How many tables were needed?  
8 tables

Help Alice find the Cheshire cat. She may pass through any section where the answer is 2, 3, 4, or 5.

## Reteaching 79

Name: \_\_\_\_\_

12 skates in all  
Groups of 3  
How many groups of 3 are there?  
12 ÷ 3 = 4  
There are 4 groups of 3 in 12.

12 skates in all  
3 equal groups  
How many are in each group?  
12 ÷ 3 = 4  
There are 4 skates in each in each group.

Divide:

1. 12 ÷ 2 = 6

2. 21 ÷ 3 = 7

3. 9 ÷ 3 = 3

4. 18 ÷ 3 = 6

5. 12 ÷ 3 = 4

6. 15 ÷ 3 = 5

Divide:

7. 6 ÷ 2 = 3

8. 4 ÷ 2 = 2

9. 8 ÷ 2 = 4

10. 24 ÷ 3 = 8

11. 18 ÷ 2 = 9

12. 14 ÷ 2 = 7



## Assignment Guide

|          |              |
|----------|--------------|
| basic    | 1–24, 31, 34 |
| average  | 1–34, 36     |
| enriched | 1–36         |

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page 380

## Follow-Up

**Extra Practice** *Draw a picture* Students can draw pictures to illustrate the basic division facts for 2 and 3. They can use Examples C and D as models for their drawings.

## Reteaching Using Concrete Materials

Have each student form groups of two from 12 counters. Ask how many groups. [6] Write  $12 \div 2 = 6$  on the chalkboard. Next have students separate 12 counters into 2 equal groups. Ask how many counters are in each group. [6] Write  $12 \div 2 = 6$  on the chalkboard.

## Enrichment Using Concrete Materials

Using 24 objects, have students find the numbers that can be grouped into both 2s and 3s with none left over. [24, 18, 12, 6]

## Reading and Writing Mathematics

Read the following division equations to students and have them write the divisor and the quotient for each one:  $21 \div 7 = 3$  [The divisor is 7, the quotient is 3.];  $12 \div 6 = 2$  [The divisor is 6, the quotient is 2.];  $7 \div 7 = 1$  [The divisor is 7, the quotient is 1.].

## Daily Maintenance

Give the numbers in order from least to greatest.

- 73 90 26 52  
[26, 52, 73, 90]
- 427 721 500 689  
[427, 500, 689, 721]
- 584 601 53 86  
[53, 86, 584, 601]
- 1,570 3,694 1,964  
[1,570, 1,964, 3,694]
- 5,725 5,276 5,674  
[5,276, 5,674, 5,725]

**Answer , page 215**

36. 2, 4, 6, 8, 10, 12, 14, 16, 18  
0, 2, 4, 6, 8

**Using Problem-Solving Strategies,**  
page 424

- c. How many groups of 3 are in 12?



$$12 \div 3 = 4 \quad 4 \times 3 = 12$$

There are 4 groups of 3 in 12.

- d. There are 12 dots. How many are there in each of 3 equal groups?



$$12 \div 3 = 4 \quad 3 \times 4 = 12$$

There are 4 in each of 3 equal groups.

**Try** Divide.

- a.  $18 \div 3$     b.  $8 \div 2$     c.  $27 \div 3$     d.  $14 \div 2$     e.  $15 \div 3$     f.  $4 \div 2$   
6                  4                  9                  7                  5                  2

**Practice** Divide.

- |                      |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1. $4 \div 2$<br>2   | 2. $12 \div 3$<br>4  | 3. $16 \div 2$<br>8  | 4. $18 \div 3$<br>6  | 5. $24 \div 3$<br>8  | 6. $18 \div 2$<br>9  |
| 7. $6 \div 3$<br>2   | 8. $6 \div 2$<br>3   | 9. $15 \div 3$<br>5  | 10. $14 \div 2$<br>7 | 11. $10 \div 2$<br>5 | 12. $27 \div 3$<br>9 |
| 13. $12 \div 2$<br>6 | 14. $9 \div 3$<br>3  | 15. $8 \div 2$<br>4  | 16. $18 \div 2$<br>9 | 17. $21 \div 3$<br>7 | 18. $14 \div 2$<br>7 |
| 19. $24 \div 3$<br>8 | 20. $16 \div 2$<br>8 | 21. $12 \div 3$<br>4 | 22. $8 \div 2$<br>4  | 23. $27 \div 3$<br>9 | 24. $18 \div 3$<br>6 |
| 25. $4 \div 2$<br>2  | 26. $21 \div 3$<br>7 | 27. $15 \div 3$<br>5 | 28. $10 \div 2$<br>5 | 29. $12 \div 2$<br>6 | 30. $9 \div 3$<br>3  |

**Apply** Solve each problem.

- If 15 students were separated into groups of 3, how many groups were there?  
**5 groups**
- The teacher displayed 7 drawings on the wall, 6 on the door, and 10 along the board. How many drawings were displayed in all?  
**23 drawings**
- Kiyoko shared 8 brushes with Marsha. Each girl got an equal number of brushes. How many brushes did each girl get?  
**4 brushes**
- There were 16 students. Each student used 2 sheets of paper. How many sheets were used in all?  
**32 sheets**
- A box of paints has 18 colors. There are 3 rows of colors with the same number in each row. How many colors are in each row?  
**6 colors**
- Thinking skills** Find all the numbers from 0 through 18 that can be divided by 2. What digits are in the ones place of numbers that can be divided by 2? **See margin.**

Using Problem-Solving Strategies, page 424  
More Practice Set 79, page 380 **215**

## Enrichment 79

**Meet the Relatives** E79

Division and multiplication are related.

|  |  |
|--|--|
| $\begin{array}{r} 6 \\ 3 \overline{) 18} \\ \underline{18} \\ 0 \end{array}$ | $6 \times 3 = 18$<br>$3 \times 6 = 18$ |
| $\begin{array}{r} 7 \\ 7 \overline{) 49} \\ \underline{49} \\ 0 \end{array}$ | $7 \times 7 = 49$<br>$7 \times 7 = 49$ |
| $\begin{array}{r} 5 \\ 5 \overline{) 25} \\ \underline{25} \\ 0 \end{array}$ | $5 \times 5 = 25$<br>$5 \times 5 = 25$ |

For each division sentence, write the related multiplication sentence.

|                    |                   |
|--------------------|-------------------|
| 1. $18 \div 3 = 6$ | $9 \times 3 = 27$ |
| 2. $27 \div 3 = 9$ | $8 \times 2 = 16$ |
| 3. $16 \div 2 = 8$ | $8 \times 3 = 24$ |
| 4. $24 \div 3 = 8$ |                   |

For each multiplication sentence, write the related division sentence.

|                         |                   |
|-------------------------|-------------------|
| 5. $4 \times 3 = 12$    | $24 \div 3 = 8$   |
| 6. $8 \times 3 = 24$    | $32 \div 2 = 16$  |
| 7. $16 \div 2 = 8$      | $42 \div 2 = 21$  |
| 8. $21 \times 2 = 42$   | $282 \div 3 = 94$ |
| 9. $94 \times 3 = 282$  | $102 \div 2 = 51$ |
| 10. $51 \times 2 = 102$ |                   |

More than one answer may be correct.

## Additional Resource 79

**Additional Resource** 79

**Maintenance**

Estimate each sum or difference. First round both numbers to the nearest hundred.

|                                       |   |
|---------------------------------------|---|
| 1. $587 + 309$<br>$600 + 300 = 900$   | 2. $492 + 215$<br>$500 + 200 = 700$       |
| 3. $327 + 475$<br>$300 + 500 = 800$   | 4. $1,228 + 488$<br>$1,200 + 500 = 1,700$ |
| 5. $983 - 595$<br>$1,000 - 600 = 400$ | 6. $712 - 379$<br>$700 - 400 = 300$       |
| 7. $423 - 195$<br>$400 - 200 = 200$   | 8. $1,585 + 196$<br>$1,600 + 200 = 1,800$ |

Estimate each sum or difference. First round both numbers to the nearest thousand.

|  |   |
|--|---|
| 9. $6,257 + 1,859$<br>$6,000 + 2,000 = 8,000$  | 10. $7,853 + 2,985$<br>$8,000 + 3,000 = 11,000$ |
| 11. $8,769 - 3,875$<br>$9,000 - 4,000 = 5,000$ | 12. $9,218 + 4,075$<br>$9,000 + 4,000 = 13,000$ |
| 13. $2,876 + 3,780$<br>$3,000 + 4,000 = 7,000$ | 14. $4,219 - 1,345$<br>$4,000 - 1,000 = 3,000$  |
| 15. $5,085 - 967$<br>$5,000 - 1,000 = 4,000$   | 16. $3,585 - 1,576$<br>$4,000 - 2,000 = 2,000$  |



## Objective 80

Write quotients for division facts using 2 through 5 as divisors.

### Lesson Theme

Art: Paint

### Materials

- Tens, Units (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Have each student display 15 counters. Review the two meanings of division by having students form groups of 5. How many are there? [3] Now have students form 5 equal groups. How many are there? [3] Write  $15 \div 5 = 3$  on the chalkboard.

**Warm-Up Review** Review the multiplication basic facts for 2 through 5. Also review the terms *divisor* and *quotient*.

## Using the Pages

**Teach** Use 20 objects separated into groups of 4 to illustrate Example A and 20 objects separated into groups of 5 to illustrate Example B. Illustrate Example C by separating 20 objects, one at a time, into 4 equal groups. Illustrate Example D by separating 20 objects, one at a time, into 5 equal groups. Emphasize the related multiplication facts. Example E shows the computational form for writing division. Some people read this form as "4 divided into 20 is 5." Emphasize that the divisor is outside the division symbol and the quotient is on top.

**Estimation** Ask students the following question. About how many small jars of paint like those pictured on page 216 do you think it would take to make one gallon of paint? First let students guess. Then ask how they could get a better estimate. [Find out how many ounces are in one gallon (128 oz.) and in one small jar of paint. Multiply the number of ounces in the small jar by multiples of 10 until they get close to the number of ounces in a gallon.]

**Try** In Exercises a–c, be sure students are writing the quotient in the correct place.

### Apply Problem Solving

**Choosing a computation method** Have students quickly read through Problems 31–34. Ask students which problems require exact answers [31, 33] and which require estimates. [32, 34] Make sure students understand that Problem 34 will require two steps, multiplication and subtraction.

## Dividing by 4 and 5



There are 20 jars of paint.

- a. How many groups of 4 are there?

$$20 \div 4 = 5 \quad (5 \times 4 = 20)$$

There are 5 groups of 4.

- c. How many are there in each of 4 equal groups?

$$20 \div 4 = 5 \quad (4 \times 5 = 20)$$

There are 5 in each of 4 equal groups.

- e. Division can be written in two ways.

$$20 \div 4 = 5 \quad \begin{array}{r} \text{Quotient} \downarrow \\ 4 \overline{)20} \\ \text{Divisor} \uparrow \end{array}$$

- b. How many groups of 5 are there?

$$20 \div 5 = 4 \quad (4 \times 5 = 20)$$

There are 4 groups of 5.

- d. How many are there in each of 5 equal groups?

$$20 \div 5 = 4 \quad (5 \times 4 = 20)$$

There are 4 in each of 5 equal groups.

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## Practice 80

Divide.

|                                    |                                     |                                     |                                     |
|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. $5 \overline{)35}$              | 2. $4 \overline{)12}$               | 3. $4 \overline{)28}$               | 4. $5 \overline{)25}$               |
| 5. $5 \overline{)45}$              | 6. $4 \overline{)36}$               | 7. $5 \overline{)40}$               | 8. $4 \overline{)16}$               |
| 9. $21 \div 3 = \underline{\quad}$ | 10. $30 \div 5 = \underline{\quad}$ | 11. $24 \div 4 = \underline{\quad}$ | 12. $18 \div 3 = \underline{\quad}$ |

What am I?  
I shelter birds, bats, and bees.  
I move with the breeze.  
I furnish food for some  
and houses for others;  
Alive and fragrant, I am a tree.

To find out, work each problem  
Shade the sections where the answer is 3, 4, or 5.

## Reteaching 80

15 spoons in all  
Groups of 5  
How many groups of 5 are there?

15 spoons in all  
5 equal groups  
How many are in each group?

15 - 5 = 3 or  $5 \overline{)15}$

There are 3 groups of 5 in 15

For each picture, write a division fact.

|                 |                 |                 |
|-----------------|-----------------|-----------------|
| 1. 10 in all    | 2. 12 in all    | 3. 32 in all    |
| $10 \div 2 = 5$ | $12 \div 4 = 3$ | $32 \div 4 = 8$ |

Divide.

|                                     |                                     |                                    |
|-------------------------------------|-------------------------------------|------------------------------------|
| 4. $8 \div 4 = \underline{\quad}$   | 5. $25 \div 5 = \underline{\quad}$  | 6. $24 \div 4 = \underline{\quad}$ |
| 7. $10 \div 5 = \underline{\quad}$  | 8. $16 \div 4 = \underline{\quad}$  | 9. $35 \div 5 = \underline{\quad}$ |
| 10. $32 \div 4 = \underline{\quad}$ | 11. $15 \div 5 = \underline{\quad}$ | 12. $4 \div 4 = \underline{\quad}$ |
| 13. $4 \overline{)20}$              | 14. $5 \overline{)45}$              | 15. $5 \overline{)30}$             |
|                                     |                                     | 16. $4 \overline{)28}$             |



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–34 |
| average  | 1–34 |
| enriched | 1–34 |

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page 380

## Follow-Up

**Extra Practice Mental Math** Have a silent basic-facts drill. Say aloud division facts using 2 through 5 as divisors. Have students show the appropriate number of fingers to indicate the quotient, or have them make up cards with the digits 1–9 on them and hold up the correct card to answer.

**Reteaching** For each division exercise, have students write a multiplication question. For example:

$28 \div 4 = 7$  [28 divided by 4 equals what?]  
 $7 \times 4 = 28$  [What number times 4 equals 28? Or 4 times what number equals 28?]

**Enrichment Write a problem** Have students make up word problems using the Try exercises.

**Try** Divide.

a.  $5 \overline{)40}$     b.  $4 \overline{)24}$     c.  $5 \overline{)25}$     d.  $8 \div 4$     e.  $28 \div 4$     f.  $30 \div 5$

**Practice** Divide.

1.  $5 \overline{)10}$     2.  $4 \overline{)12}$     3.  $4 \overline{)32}$     4.  $4 \overline{)24}$     5.  $5 \overline{)20}$     6.  $4 \overline{)28}$   
 7.  $5 \overline{)35}$     8.  $5 \overline{)30}$     9.  $5 \overline{)45}$     10.  $4 \overline{)20}$     11.  $4 \overline{)8}$     12.  $5 \overline{)15}$   
 13.  $4 \overline{)16}$     14.  $5 \overline{)40}$     15.  $5 \overline{)25}$     16.  $4 \overline{)36}$     17.  $3 \overline{)12}$     18.  $2 \overline{)8}$   
 19.  $27 \div 3$     20.  $15 \div 3$     21.  $16 \div 2$     22.  $6 \div 2$     23.  $32 \div 4$     24.  $16 \div 4$   
 25.  $21 \div 3$     26.  $9 \div 3$     27.  $35 \div 5$     28.  $20 \div 5$     29.  $4 \div 2$     30.  $18 \div 2$

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used.

- Large sheets of drawing paper cost 5 cents per sheet. How many sheets can you buy for 40 cents?  
**8 sheets; M**
- The school used 347 jars of paint one year, 629 jars the second year, and 705 jars the third. How many jars were used in all?  
**1,681 jars; P, C**
- Mary has 32 jars of paint. Does she have enough paint to put 4 jars each in 10 project areas?  
**No; M**
- There were 5 boxes with 6 jars of paint in each. The students used 18 jars. Were there more or less than 10 jars of paint left?  
**More than 10 jars left; M, P**

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## Enrichment 80

Name \_\_\_\_\_ E80

**Missing Operations**

Insert +, -, ×, ÷, and = signs to make number sentences that are correct.

- $32 \bigcirc 2 = 64$
- $32 \bigcirc 2 = 30$
- $28 \bigcirc 4 = 7$
- $28 \bigcirc 4 = 10 \bigcirc 3$
- $45 \bigcirc 5 = 10 \bigcirc 5$
- $32 \bigcirc 2 \bigcirc 6 = 10$
- $5 \bigcirc 6 \bigcirc 2 = 32$
- $32 \bigcirc 2 = 34$
- $32 \bigcirc 2 = 16$
- $45 \bigcirc 5 = 9$
- $45 \bigcirc 5 = 6 \bigcirc 3$
- $21 \bigcirc 3 = 4 \bigcirc 3$
- $24 \bigcirc 4 \bigcirc 3 = 9$
- $14 \bigcirc 2 \bigcirc 8 = 56$

In each of these sentences, one of the signs is not correct. Find it and correct it.

- $15 \div 5 + 4 = 12$
- $28 \div 4 + 10 = 42$
- $45 \div 9 \times 6 - 6 = 5$
- $32 - 4 + 8 = 4 \times 4$

## Additional Resource 80



### Math Poster GG Applying Division

There are 9 cars and 7 bikes. See Answer Key and Notes for Teacher's Resource File for different ways to solve this problem.

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- $\$3.98 + \$0.49$  [\$4.47]
- $\$0.68 + \$0.76$  [\$1.44]
- $\$24.95 - \$6.85$  [\$18.10]
- $\$5.61 - \$4.22$  [\$1.39]
- $\$73.52 + \$96.39$  [\$169.91]
- $\$7.99 \times 50$  [\$399.50]



**Objective 81** (Target Objective)  
Write quotients for division facts involving 0 and 1.

### Lesson Theme

Art: Paintbrushes

### Materials

- Tens, Units (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Have a student put 3 objects in a box. Ask students how many groups of 3 objects there are. [1] Write the division equation  $3 \div 3 = 1$  on the board. Now have a student put 1 object in each of 3 boxes. Ask students how many groups there are with 1 object in each. [3] Write the division equation  $3 \div 1 = 3$  on the board. Remove the objects and ask students how many groups of 3 objects there now are. [0] Write the division equation  $0 \div 3 = 0$  on the board.

## Using the Pages

**Teach** After discussing each example, point out that since a person cannot divide by zero, zero is not considered in the statement: "When 0 is divided by any number, the answer is 0."  $0 \div 0$  is not possible.

**Try** Exercise d illustrates both a number divided by itself and a number divided by 1. Exercise e illustrates both zero divided by a number and a number divided by 1.

**Practice Mental Math** Students could do these exercises orally.

**Apply Problem Solving** Whether a student has a correct answer or not, ask the student to explain how he or she found that answer.

**Choose the operation** In each problem, ask students to describe the action of the problem. They may find it helpful to act out the problems. Problem 27 involves addition. Problem 28 involves subtraction. Problem 29 involves multiplication.

**Choosing a computation method** Read this problem to the students and have them choose whether to use pencil and paper or mental math to find the answer. Mrs. Smith has 24 students in her class. She wants to get enough easels so that every 3 students can share one. How many easels does she need to buy? [8] If each easel costs \$10.00, how much will they cost? [\$80.00]

**Calculator** In Problem 30, explain to students that they can use each key as many times as necessary.

## 1 and 0 in Division

- A.** There are 5 paintbrushes in the holder. How many groups of 5 are there?



$$5 \div 5 = 1 \quad (1 \times 5 = 5)$$

When any number is divided by itself, the answer is 1.

- C.** There are no paintbrushes in the holder. How many groups of 5 are there?



$$0 \div 5 = 0 \quad (0 \times 5 = 0)$$

When 0 is divided by any number, the answer is 0.

**Try** Divide.

**a.**  $8 \div 1 = 8$

**b.**  $0 \div 8 = 0$

**c.**  $8 \div 8 = 1$

**d.**  $1 \div 1 = 1$

**e.**  $0 \div 1 = 0$

**f.**  $0 \div 2 = 0$

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- B.** There are 5 paintbrushes in the holders. How many groups of 1 are there?



$$5 \div 1 = 5 \quad (5 \times 1 = 5)$$

When any number is divided by 1, the answer is that number.

- D.** There are 5 paintbrushes in the holder. How many groups of 0 are there?



That doesn't make sense!

Never divide by zero.

## Practice 81

Name \_\_\_\_\_

**P81**

Name two sports, one played with a small ball and the other played with a large ball.

Work each exercise. If the answer to an exercise is in the football, circle the exercise and its letter. Write the circled letters in order on the blanks below.

|                 |                 |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 2<br>2 1<br>2 T | 0<br>0 2<br>0 A | 4<br>4 4<br>4 L | 1<br>0 5<br>0 M | 5<br>5 5<br>5 E | 5<br>5 1<br>5 A |
| 0<br>0 3<br>0 N | 3<br>3 3<br>3 K | 0<br>0 9<br>0 N | 4<br>4 4<br>4 L | 4<br>4 1<br>4 I | 0<br>0 4<br>0 G |
| 7<br>7 1<br>7 S | 7<br>7 7<br>7 T | 0<br>0 7<br>0 U | 6<br>6 1<br>6 R | 0<br>0 6<br>0 S | 5<br>5 5<br>5 D |
| 5<br>0 5<br>0 L | 5<br>5 5<br>5 B | 5<br>5 1<br>5 O | 8<br>8 8<br>8 C | 4<br>4 1<br>4 I | 5<br>5 1<br>5 W |
| 6<br>6 6<br>6 A | 6<br>6 1<br>6 C | 0<br>0 6<br>0 S | 0<br>0 7<br>0 E | 0<br>0 4<br>0 R | 4<br>4 4<br>4 T |

T E N N I S and S O C C E R

## Reteaching 81

Name \_\_\_\_\_

**R81**

When any number is divided by me, the answer is that number.

When any number is divided by itself, I am the answer.

$8 \div 8 = 1$     $3 \div 3 = 1$     $9 \div 9 = 1$     $2 \div 2 = 1$

Divide.

1.  $6 \div 1 = 6$    2.  $5 \div 1 = 5$    3.  $4 \div 4 = 1$

4.  $7 \div 7 = 1$    5.  $9 \div 1 = 9$    6.  $3 \div 1 = 3$

7.  $5 \div 5 = 1$    8.  $2 \div 1 = 2$    9.  $8 \div 8 = 1$

When I am divided by any number, I am the answer.

Never divide by me. That doesn't make sense!

$0 \div 6 = 0$     $0 \div 1 = 0$

Divide.

10.  $0 \div 8 = 0$    11.  $0 \div 3 = 0$    12.  $0 \div 4 = 0$

13.  $9 \div 9 = 1$    14.  $0 \div 5 = 0$    15.  $7 \div 1 = 7$

16.  $6 \div 6 = 1$    17.  $0 \div 9 = 0$    18.  $0 \div 2 = 0$



## Practice Divide.

- |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|
| 1. $6 \div 1$<br><b>6</b>  | 2. $0 \div 3$<br><b>0</b>  | 3. $7 \div 7$<br><b>1</b>  |
| 4. $0 \div 5$<br><b>0</b>  | 5. $9 \div 9$<br><b>1</b>  | 6. $4 \div 1$<br><b>4</b>  |
| 7. $4 \div 4$<br><b>1</b>  | 8. $8 \div 1$<br><b>8</b>  | 9. $0 \div 7$<br><b>0</b>  |
| 10. $0 \div 6$<br><b>0</b> | 11. $2 \div 2$<br><b>1</b> | 12. $9 \div 1$<br><b>9</b> |
| 13. $3 \div 3$<br><b>1</b> | 14. $1 \div 1$<br><b>1</b> | 15. $0 \div 9$<br><b>0</b> |
| 16. $6 \div 6$<br><b>1</b> | 17. $2 \div 1$<br><b>2</b> | 18. $0 \div 1$<br><b>0</b> |
| 19. $0 \div 4$<br><b>0</b> | 20. $0 \div 8$<br><b>0</b> | 21. $7 \div 1$<br><b>7</b> |
| 22. $3 \div 1$<br><b>3</b> | 23. $0 \div 2$<br><b>0</b> | 24. $8 \div 8$<br><b>1</b> |

## Apply Solve each problem.

25. There are 7 easels divided equally among 7 students. How many easels will each student have?  
**1 easel**
26. Oscar had 8 feet of green yarn. How many 1-foot pieces can he cut from this?  
**8 pieces**
27. Doris had 6 white sheets of paper and 1 blue sheet. How many sheets did she have in all?  
**7 sheets**
28. Burt had 4 jars of paint on his tray. He spilled 4 of them. How many jars were not spilled?  
**0 jars**
29. There are 8 chalk boxes on the table. All of them are empty. How many pieces of chalk are there in the boxes?  
**0 pieces**
30. **Calculator** Make the display show 8. Use only these keys:  
7,  $+$ ,  $-$ ,  $\times$ ,  $\div$ ,  $=$ .  
 **$7 \div 7 + 7$**

More Practice Set 81, page 381

## COMPUTER

### BASIC: Division in PRINT Statements

In BASIC, the symbol / is used for division.

When this program is typed into a computer, the numbers are divided and only the answer is printed.

This is printed.

```
10 PRINT 45/5
20 PRINT 18/3
30 END
```

9  
6

Tell what would be printed for each program. Watch for semicolons.

- 10 PRINT 36/4 **9**  
20 END
- 10 PRINT 15/3; **5 5**  
20 PRINT 20/4  
30 END
- 10 PRINT 8/2 **4**  
20 PRINT 8/4 **2**  
30 PRINT 8/1 **8**  
40 END
- 10 PRINT 35/5; **7 5 3**  
20 PRINT 25/5;  
30 PRINT 15/5  
40 END
- 10 REM DIVISION **27/3 = 9**  
20 PRINT "27/3; =" ;  
30 PRINT 27/3  
40 END
- 20 PRINT 24+6 **18**  
40 END **30**  
30 PRINT 24\*6 **144**  
10 PRINT 24-6

219

## Assignment Guide

basic 1-30  
average 1-30  
enriched 1-30

More Practice Set 81,  
page 381

## Follow-Up

**Extra Practice** Have students play the game that is described on pages 10-11. Write the division facts 0-5 on the cards.

## Reteaching Using Concrete Materials

Have students use objects to illustrate each Try exercise. Then have them give the rule for each Practice exercise.

Have students make up a file of their own flashcards with division basic facts for 0-5 (the exercises would be written on one side of the card with the answer on the back). Students can use the cards to test themselves and check their answers independently.

## Computer

Tell students that the dividend is the first number given when a division problem is stated in a BASIC statement.

If a computer will be used for these exercises, you may have to substitute commas for the semicolons if your computer does not leave spaces before new numbers.

## Reading and Writing Mathematics

Read the following sentences and have students write them using only numerals and symbols. Eighteen divided by three is six. [ $18 \div 3 = 6$ ] Twenty-four divided by eight is three. [ $24 \div 8 = 3$ ] Twenty divided by five is four. [ $20 \div 5 = 4$ ]

## Computer Assisted Instruction

Mathematics Courseware Series

• Division 1, Activity 2

## Cooperative Learning Groups

See page 481 of this Teacher's Edition.

## Daily Maintenance

- 1,950 - 1,268 [682]
- 7,429 - 3,684 [3,745]
- 8,535 - 5,926 [2,609]
- 9,704 - 6,930 [2,774]
- 1,865 - 1,397 [468]


## Enrichment 81

Name \_\_\_\_\_ E81

**What Number Am I?**

Use the clues to discover each number.

- If you add 7 to me and then divide the result by me, the answer is 8. What number am I? **1**
- Divide me by 4 and you get a number that is 4 more than 4. What number am I? **32**
- If you divide me by any number, I am the answer. What number am I? **0**
- Add 4 and 5 and then divide the result by me. I am the answer. What number am I? **3**
- Divide 12 by 4 and you get me. Divide 12 by me and you get 4. What number am I? **3**
- If you divide 18 by me, the answer is 2 times me. What number am I? **3**
- Multiply me by 5 and divide by 1. You'll get 35 when you are done. What number am I? **7**
- Divide me by 4 or multiply me by 5. The answer is the same. What number am I? **0**
- Divide 16 by me and the answer is me. What number am I? **4**
- Myself times me is 12 divided by 3. What number am I? **2**



## Additional Resource 81

Name \_\_\_\_\_ Additional Resource 81

**Maintenance**

Circle the factors used to estimate each product.

|  |                                  |                                  |                |                                  |
|--|----------------------------------|----------------------------------|----------------|----------------------------------|
| 1. $49 \times 9 \approx$ <u>500</u>    | $40 \times 9$                    | $40 \times 10$                   | $50 \times 9$  | <u><math>50 \times 10</math></u> |
| 2. $78 \times 21 \approx$ <u>1,600</u> | $70 \times 20$                   | $80 \times 20$                   | $70 \times 30$ | $80 \times 30$                   |
| 3. $61 \times 31 \approx$ <u>1,800</u> | <u><math>60 \times 30</math></u> | $60 \times 40$                   | $70 \times 30$ | $70 \times 40$                   |
| 4. $67 \times 75 \approx$ <u>5,600</u> | $60 \times 70$                   | $60 \times 80$                   | $70 \times 70$ | <u><math>70 \times 80</math></u> |
| 5. $29 \times 42 \approx$ <u>1,200</u> | $20 \times 40$                   | <u><math>30 \times 40</math></u> | $20 \times 50$ | $30 \times 50$                   |
| 6. $64 \times 88 \approx$ <u>5,400</u> | $60 \times 80$                   | <u><math>60 \times 90</math></u> | $70 \times 80$ | $70 \times 90$                   |
| 7. $8 \times 88 \approx$ <u>720</u>    | $8 \times 80$                    | <u><math>6 \times 90</math></u>  | $10 \times 80$ | $10 \times 90$                   |
| 8. $49 \times 49 \approx$ <u>2,500</u> | $40 \times 40$                   | $40 \times 50$                   | $50 \times 40$ | <u><math>50 \times 50</math></u> |

First round each number to the nearest ten. Then multiply.

|   |   |
|---|---|
| 9. $57 \times 69$<br><u><math>60 \times 70 = 4,200</math></u>     | 10. $41 \times 32$<br><u><math>40 \times 30 = 1,200</math></u>    |
| 11. $29 \times 51$<br><u><math>30 \times 50 = 1,500</math></u>    | 12. $79 \times 87$<br><u><math>80 \times 90 = 7,200</math></u>    |
| 13. $180 \times 77$<br><u><math>180 \times 80 = 14,400</math></u> | 14. $19 \times 69$<br><u><math>20 \times 70 = 1,400</math></u>    |
| 15. $609 \times 71$<br><u><math>610 \times 70 = 42,700</math></u> | 16. $181 \times 82$<br><u><math>180 \times 80 = 14,400</math></u> |



## Objective

Determine when an estimate is an adequate answer.

## Lesson Theme

School Activities: Class picnic

## Introduction

**Warm-Up Review** Have students estimate by rounding, then find the sum or product. Have them use their estimates to check if their answers are reasonable.

$$\begin{array}{r} 7,821 \\ +1,567 \\ \hline [9,388] \end{array} \quad \begin{array}{r} 248 \\ +627 \\ \hline [875] \end{array} \quad \begin{array}{r} 32 \\ \times 62 \\ \hline [1,984] \end{array} \quad \begin{array}{r} 83 \\ \times 4 \\ \hline [332] \end{array}$$

## Using the Pages

**Teach** As students decide on answers for Problems 1–4, suggest that they choose one person in their group to record all decisions that they have made. After the groups have completed Example A, have them get together with the rest of the class to discuss any other things they would need to know to plan a class picnic. [For example, where will the picnic be held? Will they need to cook food at the picnic?]

Have students read through the price list in Example B. Ask students if they would like to buy any items that are not on the list. Then ask how they could determine reasonable prices for these items. [Through newspaper ads, supermarket flyers, and so on] Students should realize that if they cannot use a calculator or paper and pencil, they need to estimate to be sure they have enough money. Have groups discuss Problems 5–7. Then have them compare their conclusions and reasoning with other groups. For Problem 7, you might want to suggest that students try estimating by rounding to a lesser place in order to make a more precise estimate.

For Example C, students should realize that the more efficient way to compute the total cost is to use a calculator. Point out that students should use their estimate to check if the exact amount is reasonable. Have students discuss how they estimated each amount. Encourage them to see that when they are estimating total cost, it is better to make an overestimate to be sure that they have enough money. Have the class discuss situations in which students would need an estimated amount and when they would need to know the exact amount. Give these examples to the class: If you were spending the day at an amusement park, you would need to know about (Continued on page 221.)

## Deciding When an Estimate Is All You Need

**A.** You and your group are in charge of buying food and supplies for your class picnic. Everyone in the class will share the food expenses.

Meet with your group. Here are some things you must decide. **Answers will vary.**

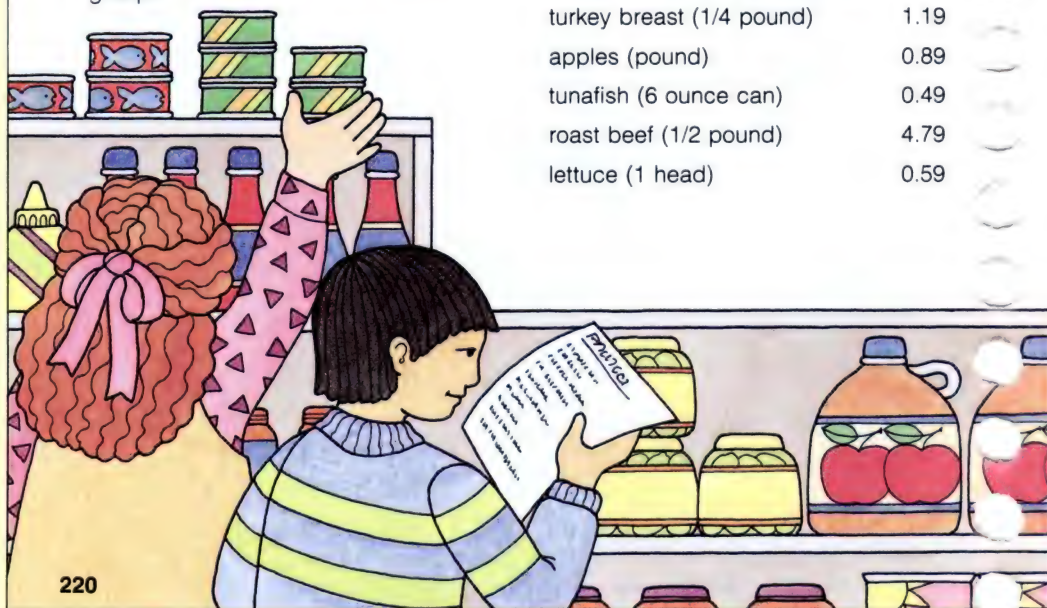
1. How much money will each person in your class contribute?
2. How many people are coming to the picnic?
3. What items do you want to buy?
4. How much of each item will you need?

Think of other things you need to decide. Talk about them with your group.

**B.** You go to the supermarket. You do not have a calculator to help you determine precisely what you are spending. You do not have the time to add with paper and pencil.

Below are the prices of some of the items you see.

|                              |        |
|------------------------------|--------|
| paper plates (12 per box)    | \$1.35 |
| apple juice (64 ounces)      | 1.59   |
| orange juice (64 ounces)     | 1.39   |
| yogurt (cup)                 | 0.55   |
| bread (24 slices a package)  | 0.99   |
| peanut butter (2 pound jar)  | 2.49   |
| tomatoes (pound)             | 1.29   |
| paper cups (36 to a box)     | 0.89   |
| cheese (12 slices a package) | 1.89   |
| turkey breast (1/4 pound)    | 1.19   |
| apples (pound)               | 0.89   |
| tunafish (6 ounce can)       | 0.49   |
| roast beef (1/2 pound)       | 4.79   |
| lettuce (1 head)             | 0.59   |





Select as many items from this list as you think you can afford. Record your choices. If some of the items you want are not on the list, decide how much money you think you need to put aside for them. **See Using the Pages.**

5. Talk about how you determined if you had enough money.
  6. Did you need to know exactly how much money you were going to spend? Why or why not?
  7. Would the way you decided you had enough money have changed if you had \$5.00 less? \$10.00 less? Talk about why or why not.
- c. Assign someone to be the supermarket cashier. Go to the checkout counter with your shopping list. Find out exactly how much money you will need to pay for your choices.
8. How did the cashier figure out how much you owe? Can you think of a better way? Talk about it with your group.
  9. Are you sure the cashier came up with the correct total? How did you check?
  10. Did you have enough money? Talk about why or why not.

Think about other situations in which you need to know if you have about enough money and when you need to know if you have exactly enough money.



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–10 |
| average  | 1–10 |
| enriched | 1–10 |

(Continued from page 220.)

how much you would need for rides, food, and souvenirs. If you were to take a bus across town, you would need to know exactly how much the bus fare would cost.

## Follow-Up

**Extra Practice** Have students work in groups. Ask each group to make a list of situations in which they would use estimation, and situations in which they would need to know an exact answer. Explain that these situations do not necessarily need to involve money amounts. They could use situations that deal with addition, subtraction, or multiplication of whole numbers.

## Daily Maintenance

Find the perimeter of each figure.

1. [43 cm]
2. [128 km]
3. [90 m]



## Objective 82

Write quotients for division facts using 1 through 6 as divisors.

### Lesson Theme

Social Studies: Wampum

### Materials

- Tens, Units (Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Review the division basic facts through 5, especially  $6 \div 1$  [6],  $12 \div 2$  [6],  $18 \div 3$  [6],  $24 \div 4$  [6],  $30 \div 5$  [6].

**Motivational Situation** The next three lessons deal with trade in the American colonies. Tell students that today we use paper bills and coins for money. But when America was first beginning, other things were used for money, including salt, furs, leather, crops, and animals. Then pose the following problem to the students. Suppose our class wanted to set up a trading station at school. What types of things would you need to consider? [What type of things will be traded? What will be the medium of trade (such as money or paper clips? How will the trade prices be set? Who will be allowed to trade (just classmates or other classes too)?]

## Using the Pages

**Teach** Wampum beads were made by the North American natives from shells and were used sometimes as money. Use objects, such as beads, to illustrate the examples. Also review multiplication basic facts for 6.

**Try Error Analysis** Watch for students who place the digit in the wrong place in the quotient in Exercise a. Point out that the entire number 30 is being divided. Placing the single-digit quotient over the last digit of the number being divided indicates this. (See **Reteaching 82**.)

Have students do Exercises a–c in both the horizontal and computational forms.

**Apply Problem Solving** Displaying their work can stimulate student interest in mathematics.

**Draw a picture** Similar to the photograph in the lesson, have students illustrate Problems 28 and 29, matching beads to pennies and beaver skins to nails.

## Dividing by 6

Settlers in the early American colonies often used beads made from shells as money. These beads were called wampum.

- A.** 6 white beads were worth one penny. How much were 18 white beads worth?

How many groups of 6 are in 18?



$$18 \div 6 = 3 \quad 3 \times 6 = 18$$

18 white beads were worth 3 pennies.

- B.** 24 beads were used in 6 necklaces. The same number of beads were used in each necklace. How many beads were used in each necklace?

How many are in each of 6 equal groups?



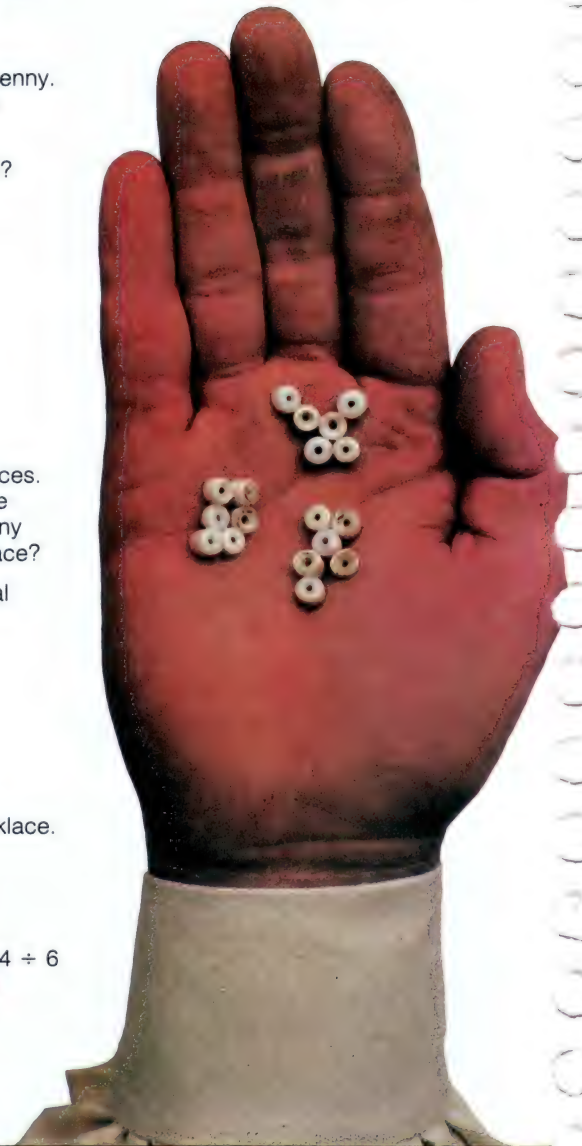
$$24 \div 6 = 4 \quad 6 \times 4 = 24$$

4 beads were used in each necklace.

**Try** Divide.

- a.**  $6 \overline{)30}$  **b.**  $36 \div 6$  **c.**  $54 \div 6$

222



## Practice 82

Name \_\_\_\_\_ P82

Divide

|                                     |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. $6 \overline{)13}$               | 2. $6 \overline{)18}$               | 3. $6 \overline{)16}$               | 4. $6 \overline{)10}$               |
| 5. $6 \overline{)130}$              | 6. $6 \overline{)116}$              | 7. $6 \overline{)124}$              | 8. $6 \overline{)136}$              |
| 9. $6 \overline{)3118}$             | 10. $6 \overline{)424}$             | 11. $6 \overline{)112}$             | 12. $6 \overline{)530}$             |
| 13. $27 \div 3 = \underline{\quad}$ | 14. $48 \div 6 = \underline{\quad}$ | 15. $54 \div 6 = \underline{\quad}$ | 16. $42 \div 6 = \underline{\quad}$ |
| 17. $35 \div 5 = \underline{\quad}$ | 18. $18 \div 2 = \underline{\quad}$ | 19. $21 \div 3 = \underline{\quad}$ | 20. $28 \div 4 = \underline{\quad}$ |

Solve each problem

21. The Striped Sox scored 18 runs in 3 innings. The same number of runs were scored in each of the innings. How many runs were scored in each of the innings?

6 runs

22. 36 fans sat in 6 rows. The same number sat in each row. How many fans sat in each row?

6 fans

## Reteaching 82

Name \_\_\_\_\_ R82

30 pails in all  
Groups of 6  
How many groups of 6 are there?

$30 \div 6 = 5$  or  $6 \overline{)30}$

There are 5 groups of 6 in 30.

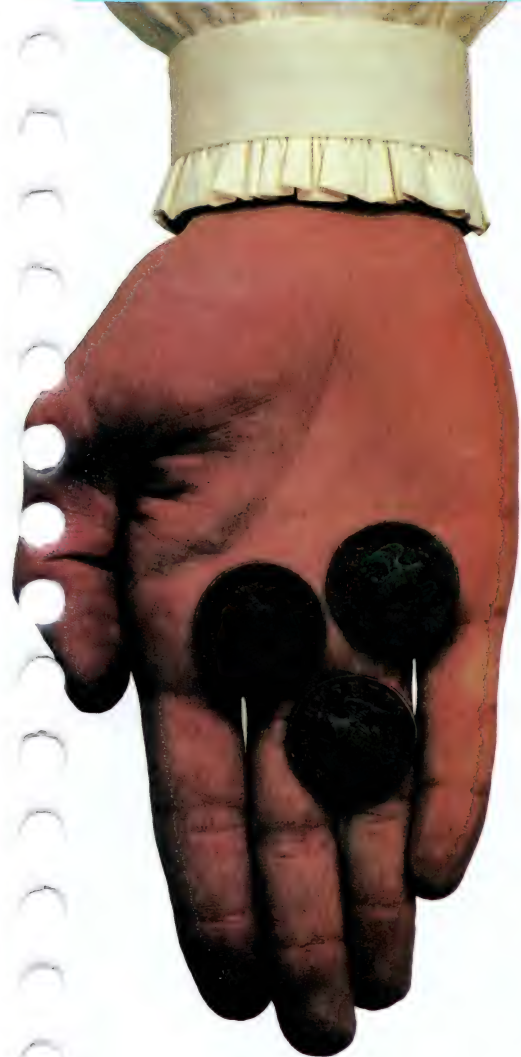
30 pails in all  
6 equal groups  
How many are in each group?

$30 \div 6 = 5$  or  $6 \overline{)30}$

There are 5 pails in each of 6 equal groups.

Divide:  
Help the penguin find his way home.  
He may pass through any section where the answer is 6.





### Practice Divide.

- |                        |                        |                        |
|------------------------|------------------------|------------------------|
| 1. $6 \overline{)12}$  | 2. $6 \overline{)48}$  | 3. $6 \overline{)6}$   |
| 4. $6 \overline{)42}$  | 5. $6 \overline{)0}$   | 6. $6 \overline{)30}$  |
| 7. $6 \overline{)18}$  | 8. $6 \overline{)12}$  | 9. $6 \overline{)54}$  |
| 10. $6 \overline{)36}$ | 11. $5 \overline{)15}$ | 12. $2 \overline{)18}$ |
| 13. $3 \overline{)21}$ | 14. $4 \overline{)32}$ | 15. $1 \overline{)6}$  |
| 16. $48 \div 6$        | 17. $24 \div 4$        | 18. $12 \div 2$        |
| 19. $9 \div 3$         | 20. $45 \div 5$        | 21. $6 \div 6$         |
| 22. $27 \div 3$        | 23. $10 \div 2$        | 24. $30 \div 5$        |
| 25. $16 \div 4$        | 26. $42 \div 6$        | 27. $18 \div 3$        |

### Apply Solve each problem.

28. If 3 purple beads were worth one penny, how much were 24 purple beads worth?  
**8 pennies**
29. If 6 beaver skins could be traded for 12 nails, how many nails could you get for one beaver skin?  
**2 nails**
30. To trade for one beaver skin, a person needed either 96 white beads or 48 purple beads. How many more white beads than purple beads were needed?  
**48 more white beads**
31. Six white beads were worth a penny. A fathom of white beads was worth 60 pennies. How many white beads were in one fathom?  
**360 white beads**

More Practice Set 82, page 381 **223**

## Assignment Guide

basic 1–21, 28–29  
average 1–30  
enriched 1–31

**More Practice Set 82,  
page 381**

## Follow-Up

**Extra Practice** Have students review division basic facts for 6 as follows. Have students count off by ones. When a student says a number that can be divided by 6, that student also says the division fact. For example, 1, 2, 3, 4, 5, 6;  $6 \div 6 = 1$ ; then continue on. Play the game to practice other division facts as well.

## Reteaching Using Concrete Materials

Have students use objects to illustrate Exercises 1–10 by making groups of 6.

## Enrichment Use data from outside the text

Students can read more about wampum or other objects used in the past for money and share what they find out with the class. Students could make up story problems using division facts through 6 with the new information. Students could also make up a bulletin board in the classroom with pictures showing other objects used for money.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Division 1, Activities 3, 4, 5

## Enrichment 82

Name \_\_\_\_\_ **E82**

### Equations Game I

This is an equations game. Any number of people can play.

Make a set of 50 cards for each player. Each set needs one card for each of the numbers 0–44, and one card each for the symbols for multiplication, division, addition, subtraction, and equals.

Players make equations using their cards. They may reuse only the operation signs and the equals sign. Each correct equation made with the cards is written down on a score sheet for that player.

The player who has made the most correct equations is the winner.

$36 \div 4 = 9$   
 $7 + 8 = 15$

$12 \div 2 = 6$

## Additional Resource 82

Name \_\_\_\_\_ **Additional Resource 82**

### Maintenance

Multiply.

|                                     |                                      |                                      |                                      |
|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 1. $46 \times 23$<br><b>1,058</b>   | 2. $87 \times 56$<br><b>4,872</b>    | 3. $90 \times 41$<br><b>3,690</b>    | 4. $429 \times 35$<br><b>15,015</b>  |
| 5. $705 \times 68$<br><b>47,940</b> | 6. $913 \times 87$<br><b>79,431</b>  | 7. $800 \times 74$<br><b>59,200</b>  | 8. $470 \times 85$<br><b>39,950</b>  |
| 9. $653 \times 71$<br><b>46,363</b> | 10. $534 \times 60$<br><b>32,040</b> | 11. $908 \times 55$<br><b>49,940</b> | 12. $777 \times 77$<br><b>59,829</b> |

Solve each problem.

13. 15 students each sold 25 tickets to the school bazaar. How many tickets did they sell in all?  
**375 tickets**

14. Tom worked 35 hours a week for 12 weeks during the summer. How many hours did he work in all?  
**420 hours**

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- $5 \times 42$  [210]
- $3 \times 605$  [1,815]
- $7 \times 222$  [1,554]
- $8 \times 19$  [152]
- $5 \times 4,300$  [21,500]
- $9 \times 5,555$  [49,995]



## Objective 83

Write quotients for division facts using 1 through 7 as divisors.

### Lesson Theme

Social Studies: Ships

### Materials

- Tens, Units (Punchouts or Math Kit)

### Introduction

**Using Concrete Materials** Set up a store in the classroom with various objects marked with prices that are multiples of 7 cents. Tell students that the punchout unit counters are worth 7¢ each. Have them purchase objects with their counters. They will need to determine how many counters each object is worth.

**Warm-Up Review** Review these basic division facts:  $14 \div 2$  [7],  $21 \div 3$  [7],  $28 \div 4$  [7],  $35 \div 5$  [7],  $42 \div 6$  [7].

Discuss trading between the American colonies and Europe. The colonies provided raw materials such as furs and cotton. In return, they received manufactured goods and foods not available in the colonies.

### Using the Pages

**Teach** Read the example. Represent the 35 ships using objects. Ask how many groups of 7 there are. [5] Then ask how many objects are in 7 equal groups. [5] Write both the horizontal ( $35 \div 7$ ) and the computational ( $7 \overline{)35}$ ) forms on the board.

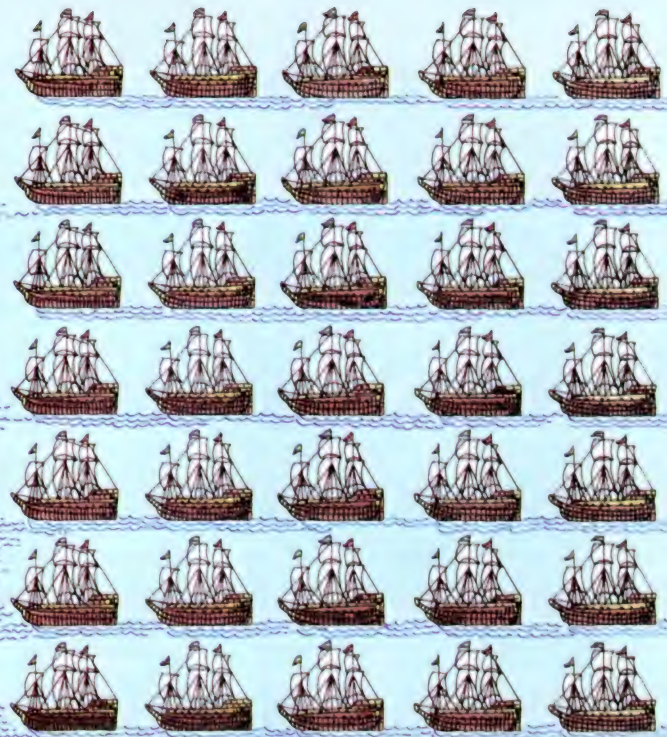
**Try** Have students work Exercises a–c on the board to check for the correct placement of the quotient.

**Practice** Point out to the students that the divisors in these exercises are mixed.

### Apply Problem Solving

**Choosing a computation method** Have students explain why they chose the method they did. For Problem 51, ask students how many pounds equal 1 ton. [2,000 lbs] In Problem 52, students should see that both answers are reasonable. If it did take a ship 63 days to make the journey, then the answer 9 weeks is exact, since  $63 \text{ (days)} \div 7 \text{ (days per week)} = 9 \text{ (weeks)}$ . Point out that two months is reasonable since  $2 \text{ months} \times 30 \text{ days (about how many days are in a month)} = 60 \text{ days}$ .

## Dividing by 7



Merchant ships, like those above, carried food and other goods to trade in the American colonies.

There are 35 ships.

Think of 7 groups with 5 ships in each group.

Or, think of 7 ships in each of 5 equal groups.

$$7 \times 5 = 35$$

$$5 \times 7 = 35$$

$$35 \div 7 = 5 \text{ or } 7 \overline{)35}$$

**Try** Divide.

a.  $7 \overline{)7}$

b.  $7 \overline{)42}$

c.  $7 \overline{)21}$

d.  $63 \div 7$

e.  $14 \div 7$

f.  $49 \div 7$

224

## Practice 83

Name: \_\_\_\_\_

What kind of pencil is always ready to handle mistakes?

To find out, work each exercise. If the answer to an exercise is in the oval, cross out the box that contains that exercise. Then write the remaining letters in order on the blanks below.

P83

|                               |                               |
|-------------------------------|-------------------------------|
| 42 7 28 7 35 7<br>6 R 4 A 5 N | 21 7 14 7 0 7<br>3 E 2 T 0 R  |
| 14 7 7 7 24 6<br>2 A 1 S 4 O  | 30 5 35 7 40 5<br>6 E 5 I 8 R |
| 0 5 0 7 0 3<br>0 L 0 B 0 I    | 63 7 15 5 14 7<br>9 O 3 N 2 P |
| 14 7 0 7 7 1<br>2 E 0 A 7 C   | 42 7 21 3 28 4<br>6 H 7 D 7 S |
| 56 7 21 7 35 5<br>8 E 3 M 7 N | 21 3 7 7 49 7<br>7 W 1 D 7 T  |

A pencil with A N E R A S E R  
O N E A C H E N D

## Reteaching 83

Name: \_\_\_\_\_

21 fish in all  
Groups of 7  
How many groups of 7 are there?

21 ÷ 7 = 3 or 7/21  
There are 3 groups of 7 in 21

For each picture, write a division fact two different ways.

14 turtles in all  
 $4 \times 7 = 28$  or  $7 \times 4 = 28$

28 starfish in all  
 $28 \div 7 = 4$  or  $7 \times 4 = 28$

R83

21 fish in all  
7 equal groups  
How many are in each group?

21 ÷ 7 = 3 or 7/21  
There are 3 fish in each of 7 equal groups.

Divide:

|                        |                        |                        |
|------------------------|------------------------|------------------------|
| 3. $28 \div 7 = 4$     | 4. $7 \div 7 = 1$      | 5. $35 \div 7 = 5$     |
| 6. $42 \div 7 = 6$     | 7. $63 \div 7 = 9$     | 8. $49 \div 7 = 7$     |
| 9. $7 \overline{)14}$  | 10. $7 \overline{)15}$ | 11. $7 \overline{)17}$ |
| 12. $4 \overline{)6}$  | 13. $6 \overline{)24}$ | 14. $5 \overline{)30}$ |
| 15. $2 \overline{)14}$ | 16. $7 \overline{)0}$  | 17. $3 \overline{)12}$ |
| 18. $6 \overline{)42}$ | 19. $5 \overline{)25}$ | 20. $2 \overline{)6}$  |



## Practice Divide.

- |                        |                        |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1. $7 \overline{)28}$  | 2. $7 \overline{)42}$  | 3. $7 \overline{)56}$  | 4. $7 \overline{)35}$  | 5. $7 \overline{)14}$  | 6. $7 \overline{)0}$   |
| 7. $7 \overline{)21}$  | 8. $7 \overline{)7}$   | 9. $7 \overline{)49}$  | 10. $7 \overline{)63}$ | 11. $3 \overline{)12}$ | 12. $5 \overline{)25}$ |
| 13. $6 \overline{)24}$ | 14. $4 \overline{)28}$ | 15. $2 \overline{)10}$ | 16. $1 \overline{)7}$  | 17. $6 \overline{)36}$ | 18. $5 \overline{)30}$ |
| 19. $3 \overline{)21}$ | 20. $2 \overline{)6}$  | 21. $4 \overline{)20}$ | 22. $1 \overline{)1}$  | 23. $2 \overline{)14}$ | 24. $6 \overline{)54}$ |
| 25. $14 \div 7$        | 26. $40 \div 5$        | 27. $35 \div 7$        | 28. $9 \div 1$         | 29. $12 \div 4$        | 30. $49 \div 7$        |
| 31. $2 \div 2$         | 32. $0 \div 7$         | 33. $6 \div 3$         | 34. $42 \div 6$        | 35. $28 \div 7$        | 36. $2 \div 1$         |
| 37. $56 \div 7$        | 38. $12 \div 2$        | 39. $35 \div 5$        | 40. $21 \div 7$        | 41. $3 \div 3$         | 42. $63 \div 7$        |
| 43. $30 \div 6$        | 44. $8 \div 4$         | 45. $7 \div 7$         | 46. $18 \div 6$        | 47. $20 \div 5$        | 48. $42 \div 7$        |

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.

49. A large ship had 12 sails on 3 masts. The same number of sails were on each mast. How many sails were on each mast?  
**4 sails; M**
51. If one merchant ship weighed 175 tons, how many pounds would 35 merchant ships weigh?  
**12,250,000 pounds; C**
50. The length of a merchant ship was 90 feet. Its width was 26 feet. How much greater was its length than its width?  
**64 feet; P**
52. In colonial times, it took a ship about 63 days to cross the Atlantic Ocean. Jason said it took about 2 months. Emily said it took about 9 weeks. Are the answers exact? Are they reasonable? Explain.  
**See Using the Pages.**

## MAINTENANCE

Multiply.

- |                    |                    |                    |                    |                    |                  |
|--------------------|--------------------|--------------------|--------------------|--------------------|------------------|
| 1. $5 \times 6$    | 2. $3 \times 4$    | 3. $9 \times 5$    | 4. $8 \times 6$    | 5. $2 \times 9$    | 6. $7 \times 4$  |
| 30                 | 12                 | 45                 | 48                 | 18                 | 28               |
| 7. $1 \times 9$    | 8. $7 \times 8$    | 9. $0 \times 5$    | 10. $3 \times 7$   | 11. $8 \times 2$   | 12. $2 \times 6$ |
| 9                  | 56                 | 0                  | 21                 | 16                 | 12               |
| 13. $73 \times 3$  | 14. $28 \times 9$  | 15. $34 \times 40$ | 16. $87 \times 50$ | 17. $21 \times 43$ |                  |
| 219                | 252                | 1,360              | 4,350              | 903                |                  |
| 18. $22 \times 14$ | 19. $42 \times 36$ | 20. $67 \times 63$ | 21. $97 \times 55$ | 22. $46 \times 58$ |                  |
| 308                | 1,512              | 4,221              | 5,335              | 2,668              |                  |

More Practice Set 83, page 381 **225**

## Assignment Guide

basic 1-50  
average 1-52  
enriched 1-52

**More Practice Set 83,  
page 381**

## Homework to do with others

Have students use the information in the *Apply* problems and some additional research to compare colonial merchant ships to modern merchant ships. Tell students to discuss with an adult contrasts in such areas as length of crossing, weight of ship, and amount of cargo. Ask students to present their information in table form so it can be used in a bulletin board display.

## Follow-Up

**Reteaching** Have students draw 7 dots in each of two rows to make an array of 14. Have students circle each set of 7 dots to show how many groups of 7 in 14. [2]

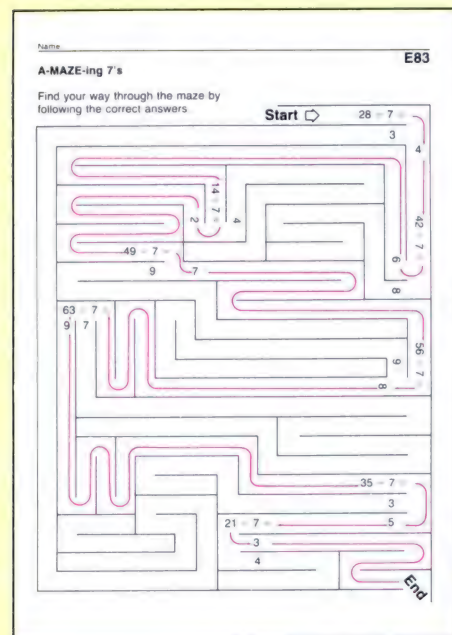


$$14 \div 7 = 2$$

Have students draw arrays and circle groups of dots to show the other division basic facts of 7.

**Enrichment** Students should work in pairs to do the following. One student writes a division fact with a divisor of 7. The other student must write another division fact that has the same quotient. For example:  $63 \div 7 = 9$  and  $45 \div 5 = 9$ .

## Enrichment 83



## Additional Resource 83

Name \_\_\_\_\_

**Additional Resource 83**

**Computer BASIC: Division**

The computer uses the symbol  $\div$  for division.

Type each of these instructions. Write the outputs.

|               |   |               |   |
|---------------|---|---------------|---|
| 1. PRINT 28/4 | 7 | 2. PRINT 30/6 | 5 |
| 3. PRINT 40/5 | 8 | 4. PRINT 35/7 | 5 |

Write what you think the output from Exercises 5-6 will be. Enter each program and run it to check your answer.

|   |   |
|---|---|
| 5. 10 REM DIVISION BY SIX<br>20 PRINT "42/6="; 42/6<br>30 PRINT "48/6="; 48/6<br>40 PRINT "54/6="; 54/6<br>50 END | 6. 10 REM DIVISION BY SEVEN<br>20 PRINT "63/7="; 63/7<br>30 PRINT "70/7="; 70/7<br>40 PRINT "84/7="; 84/7<br>50 END |
| 42/6=7  | 63/7=9  |
| 48/6=8  | 70/7=10   |
| 54/6=9  | 84/7=12   |

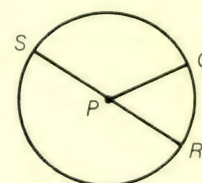
Write an instruction that will give the answer for each of the division problems below.

|           |              |          |            |
|-----------|--------------|----------|------------|
| 7. 32/4   | PRINT 32/4   | 8. 25/5  | PRINT 25/5 |
| 9. 100/10 | PRINT 100/10 | 10. 27/3 | PRINT 27/3 |

11. Write a program that will divide the numbers 2, 4, 6, and 8 by 2. Show your answer on another page.

Answers will vary

## Daily Maintenance



For the circle above name:

- the center. [Point P]
- a radius. [Segment SP, PQ, or PR]
- a diameter. [Segment SR]



## Objective 84

Write quotients for division facts using 1 through 8 as divisors.

### Lesson Theme

Social Studies: Spanish Gold Coins

### Materials

- Money (Punchouts)
- Classroom objects

### Introduction

**Warm-Up Review** Review division facts with an oral drill using questions such as the following: How much would one item cost if 2 cost 18¢ [9¢], if 3 cost 24¢ [8¢], if 4 cost 32¢ [8¢], if 5 cost 25¢ [5¢], if 6 cost 6¢ [1¢], and if 7 cost 56¢ [8¢]

**Motivational Situation** Tell students that the colonists were not allowed to make their own coins. Therefore they used whatever coins they could get including various types of Spanish coins, such as the gold coins in the picture and the Spanish dollar or peso. Pose the following problem to the students. Why did the colonists want to have coins instead of the other things they used for trade? [Coins are easier to carry, exact prices could be set] Besides coins, what types of things do people use to pay for purchases today? [Paper money, checks, credit cards]

### Using the Pages

**Teach Using Concrete Materials** In addition to goods such as furs and wampum, the colonists used foreign coins as money. Represent the example with 48 coins in play money or other objects. Form groups of 8 and ask how many groups. [6] Form 8 equal groups and ask how many in each group. [6]

**Practice** Remind students to think of the related multiplication fact when trying to remember a division fact.

**Apply Problem Solving** Encouraging creative thinking rather than correct solutions will help students improve their problem-solving skills.

**Additional problem** Problem 53 states that a Spanish dollar could be cut into 8 bits. Tell students this jingle: "2 bits, 4 bits, 6 bits, a dollar, all for (name) stand up and holler." Ask them to tell how much 2 bits, 4 bits, and 6 bits would be in today's money. [25 cents, 50 cents, 75 cents]

## Dividing by 8



Spanish gold coins were commonly used in the American colonies.

There are 48 coins.

Think of 8 groups with 6 coins in each group.

Or, think of 8 coins in each of 6 equal groups.

$$8 \times 6 = 48$$

$$6 \times 8 = 48$$

$$48 \div 8 = 6 \text{ or } 8 \overline{)48} \begin{array}{r} 6 \end{array}$$

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## Practice 84

Name \_\_\_\_\_ P84

Divide:

|                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|
| 1. $8 \overline{)16}$  | 2. $4 \overline{)32}$  | 3. $8 \overline{)8}$   | 4. $8 \overline{)48}$  |
| 5. $5 \overline{)40}$  | 6. $7 \overline{)49}$  | 7. $3 \overline{)24}$  | 8. $8 \overline{)40}$  |
| 9. $7 \overline{)56}$  | 10. $8 \overline{)0}$  | 11. $6 \overline{)48}$ | 12. $8 \overline{)64}$ |
| 13. $32 \overline{)8}$ | 14. $54 \overline{)6}$ | 15. $42 \overline{)7}$ | 16. $56 \overline{)8}$ |
| 17. $24 \overline{)8}$ | 18. $0 \overline{)8}$  | 19. $72 \overline{)8}$ | 20. $63 \overline{)7}$ |

Solve each problem

21. Angela put 64 stamps into 8 envelopes. Each envelope had the same number of stamps. How many stamps were in each envelope?  
8 stamps

22. 5 students have a total of 40 stamp books. Each student has the same number of books. How many books does each student have?  
8 books

## Reteaching 84

Name \_\_\_\_\_ R84

24 planets in all  
Groups of 8  
How many groups of 8 are there?

$24 \div 8 = 3$  or  $8 \overline{)24}$   
There are 3 groups of 8 in 24.

24 planets in all  
8 equal groups  
How many are in each group?

$24 \div 8 = 3$  or  $8 \overline{)24}$   
There are 3 planets in each of 8 equal groups.

For each picture, write a division fact two different ways.

1. 8 helmets in all

$8 \div 8 = 1$  or  $8 \overline{)8}$

2. 32 stars in all

$32 \div 8 = 4$  or  $8 \overline{)32}$

Divide:

|                        |                        |                        |
|------------------------|------------------------|------------------------|
| 3. $16 \div 8 =$ 2     | 4. $48 \div 8 =$ 6     | 5. $40 \div 8 =$ 5     |
| 6. $32 \div 8 =$ 4     | 7. $56 \div 8 =$ 7     | 8. $8 \div 8 =$ 1      |
| 9. $8 \overline{)64}$  | 10. $8 \overline{)72}$ | 11. $8 \overline{)24}$ |
| 12. $4 \overline{)32}$ | 13. $5 \overline{)40}$ | 14. $4 \overline{)28}$ |
| 15. $7 \overline{)56}$ | 16. $6 \overline{)30}$ | 17. $3 \overline{)18}$ |
| 18. $2 \overline{)16}$ | 19. $5 \overline{)45}$ | 20. $8 \overline{)64}$ |



Try Divide.

a.  $8 \overline{)24}$     b.  $8 \overline{)56}$     c.  $8 \overline{)1}$     d.  $64 \div 8$     e.  $40 \div 8$     f.  $16 \div 8$

Practice Divide.

1.  $8 \overline{)32}$     2.  $8 \overline{)72}$     3.  $8 \overline{)0}$     4.  $8 \overline{)48}$     5.  $8 \overline{)24}$     6.  $8 \overline{)8}$   
 7.  $8 \overline{)40}$     8.  $8 \overline{)56}$     9.  $8 \overline{)64}$     10.  $8 \overline{)16}$     11.  $7 \overline{)14}$     12.  $4 \overline{)36}$   
 13.  $2 \overline{)16}$     14.  $6 \overline{)12}$     15.  $3 \overline{)15}$     16.  $5 \overline{)35}$     17.  $1 \overline{)3}$     18.  $6 \overline{)54}$   
 19.  $4 \overline{)32}$     20.  $7 \overline{)49}$     21.  $3 \overline{)24}$     22.  $1 \overline{)8}$     23.  $5 \overline{)10}$     24.  $2 \overline{)14}$   
 25.  $40 \div 8$     26.  $18 \div 3$     27.  $24 \div 3$     28.  $5 \div 5$     29.  $7 \div 1$     30.  $56 \div 8$   
 31.  $21 \div 7$     32.  $8 \div 8$     33.  $48 \div 6$     34.  $72 \div 8$     35.  $4 \div 4$     36.  $16 \div 8$   
 37.  $8 \div 2$     38.  $40 \div 5$     39.  $0 \div 8$     40.  $42 \div 7$     41.  $32 \div 8$     42.  $24 \div 6$   
 43.  $64 \div 8$     44.  $16 \div 4$     45.  $4 \div 2$     46.  $6 \div 3$     47.  $48 \div 8$     48.  $56 \div 7$

Apply Solve each problem.

49. A storekeeper separated 64 Spanish gold coins equally among 8 pouches. How many coins did he put into each pouch?  
**8 coins**
51. A trapper brought in 27 beaver skins. He was paid one Spanish dollar for every 3 skins. How many Spanish dollars was he paid?  
**9 Spanish dollars**
53. A Spanish dollar was also called a *piece of eight* because it could be cut into 8 equal pieces called *bits*. How many *bits* could be cut from 5 Spanish dollars?  
**40 bits**
50. A Spanish dollar was worth 8 *reales* or 72 English pennies. How many English pennies was each *real* worth?  
**9 English pennies**
52. If 5 bolts of the same kind of cloth cost 10 Spanish dollars, how much did each bolt cost?  
**2 Spanish dollars**
- \*54. One English penny would buy 6 white beads. If 72 English pennies were worth the same as 1 Spanish dollar, how many white beads could be bought with one Spanish dollar?  
**432 beads**

More Practice Set 84, page 382 227

## Assignment Guide

basic 1-49  
 average 1-52  
 enriched 1-54

More Practice Set 84,  
 page 382

### Homework to do with others

Give students the following assignment: Ask an adult to help you determine the value of a Spanish dollar, a *piece of eight*, today. Record the source of your information, for example, a coin collector, a library book, or a museum. Discuss with the adult whether the value is because of the gold or because of the coin itself. Give a short oral report in class.

### Follow-Up

**Extra Practice** Have students play the game described on pages 294-295 using division basic facts through 8 on the cards.

**Reteaching** Have students write the division facts for 8 and the corresponding multiplication fact for each.

**Enrichment** Have students find out more about the history of money in this country.

**Find a pattern** Have students complete each table and then write a rule that pairs the left-hand entry with the right-hand entry.

|   |      |   |      |
|---|------|---|------|
| 0 | 3    | 0 | 0    |
| 1 | 8    | 1 | 1    |
| 2 | 13   | 2 | 4    |
| 3 | [18] | 3 | 9    |
| 4 | [23] | 4 | [16] |
| 5 | [28] | 5 | [25] |
| 6 | [33] | 6 | [36] |
| 7 | [38] | 7 | [49] |
| 8 | [43] | 8 | [64] |
| 9 | [48] | 9 | [81] |

[Rule: Multiply by 5, then add 3.]

[Rule: Multiply each entry by itself.]

### Daily Maintenance

**Estimation** Choose the more sensible measure.

- Capacity of a fish tank  
 4 pt.    4 gal.    [4 gal.]
- Capacity of a coffeepot  
 10 c.    10 qt.    [10 c.]
- Capacity of a juice pitcher  
 2 c.    2 qt.    [2 qt.]
- Capacity of a drinking glass  
 1 c.    1 gal.    [1 c.]

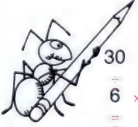
## Enrichment 84

Name \_\_\_\_\_ E84

Equations Game II

Insert +, -, ×, ÷, and = signs to make equations. Make as many equations as you can. Answers will vary. Sample answers are given.

16 ÷ 4 = 4    36 ÷ 6 + 6 = 12  
 2 × 24 ÷ 6 = 4    18 ÷ 3 = 6  
 8 × 28 ÷ 8 + 9 = 17    15 × 63  
 10 × 7 × 45 ÷ 52 ÷ 35 ÷ 5 = 7  
 20 ÷ 4 = 5    24 ÷ 8 = 3    9  
 30 ÷ 27 ÷ 9 = 3    72 ÷ 8 = 9  
 6 × 8 = 48    27 ÷ 9 × 6 = 54  
 5 × 48 ÷ 6 × 8 + 64 = 72  
 72 ÷ 8 = 9    35 ÷ 7 + 5 = 12  
 36 ÷ 6 = 6    12 × 3 + 4 = 7



## Additional Resource 84

Name \_\_\_\_\_ Additional Resource 84

Maintenance

Add, subtract, or multiply.

1.  $457 + 35 = 492$     2.  $457 - 35 = 422$     3.  $457 \times 35 = 15,995$     4.  $206 \div 37 = 169$   
 5.  $206 \div 37 = 243$     6.  $206 \times 37 = 7,622$     7.  $500 \times 26 = 13,000$     8.  $708 \div 35 = 24,780$   
 9.  $5703 - 1,786 = 3,917$     10.  $3920 + 5,795 = 9,715$     11.  $9006 \div 2058 = 6,948$     12.  $963 \times 64 = 60,892$

Solve each problem.

13. A case of orange juice contains 24 cans. How many cans does 288 cases contain?  
**6,912 cans**

14. A grocery store has 288 cases of orange juice. It sells 198 cases. How many cases are left?  
**90 cases**



## Objective 85 (Target Objective)

Write quotients for division facts using 1 through 9 as divisors, and identify multiplication and division sentences that belong to a family of facts.

### Lesson Theme

Recreation: Baseball Teams

### Materials

- Tens, Units (Punchouts or Math Kit)

### Introduction

**Warm-Up Review** Review multiplication facts for 9 orally. Note that the sum of the digits of each product of these facts is also 9.

### Using the Pages

**Teach** Ask how many players are on a baseball team. [9] Ask how many players in 3 teams. [27] Write the multiplication equation on the board. [ $3 \times 9 = 27$ ] Ask the students what type of equation they would write to show how many teams can be formed with 27 players. [Division] Have a student write the equation on the board. [ $27 \div 9 = 3$ ] Finally, ask for the family of facts for 3, 9, and 27. [ $9 \times 3 = 27$ ,  $3 \times 9 = 27$ ,  $27 \div 3 = 9$ ,  $27 \div 9 = 3$ ] In example C, discuss why there can be only two number sentences. [The two factors are the same.]

**Try Error Analysis** Watch for students who have difficulty doing Exercise k. Help these students see that when only 2 numbers are given, the third number in the family of facts must be the same as one of the other two. If they are not sure which number to use twice, have them try each number to see which will work.

**Practice** In Exercises 43–46, point out that the product is not the last number in the series. In Exercise 47, there are only 3 facts because it is impossible to use zero as a divisor.

**Apply Problem Solving** For Problem 48, discuss the possibility that if each team has exactly 9 players, then John's statement is true. There would be at least 11 teams. If each team has extra players, John's statement could also be correct. Accept any answer that students can justify.

**Additional Problem** Discuss with students that major league baseball teams do not have just 9 players on a team. They can have as many as 25 active players. Ask them if a major league team would have enough players to make 2 teams to play against each other. [Yes.] Then ask how many players would still be on the bench. [7]

## Dividing by 9

- A. There are 9 players on each baseball team.

There are 63 players.

Think of 9 players in each of 7 equal groups.

$$7 \times 9 = 63$$



## Practice 85

Name \_\_\_\_\_

Divide:

|                                    |                                     |                                     |                                     |
|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. $9 \overline{)27}$              | 2. $9 \overline{)45}$               | 3. $9 \overline{)18}$               | 4. $9 \overline{)9}$                |
| 5. $9 \overline{)81}$              | 6. $9 \overline{)36}$               | 7. $9 \overline{)0}$                | 8. $5 \overline{)45}$               |
| 9. $42 \div 6 = \underline{\quad}$ | 10. $72 \div 9 = \underline{\quad}$ | 11. $63 \div 9 = \underline{\quad}$ | 12. $54 \div 9 = \underline{\quad}$ |

Write a family of facts using the given numbers.

|  |  |  |  |
|--|--|--|--|
| 13. 9, 6, 54<br>$9 \times 6 = 54$<br>$6 \times 9 = 54$<br>$54 \div 6 = 9$<br>$54 \div 9 = 6$ | 14. 3, 9, 27<br>$3 \times 9 = 27$<br>$9 \times 3 = 27$<br>$27 \div 9 = 3$<br>$27 \div 3 = 9$ | 15. 5, 8, 40<br>$5 \times 8 = 40$<br>$8 \times 5 = 40$<br>$40 \div 8 = 5$<br>$40 \div 5 = 8$ | 16. 1, 4<br>$1 \times 4 = 4$<br>$4 \times 1 = 4$<br>$4 \div 1 = 4$<br>$4 \div 4 = 1$         |
| 17. 6, 7, 42<br>$6 \times 7 = 42$<br>$7 \times 6 = 42$<br>$42 \div 6 = 7$<br>$42 \div 7 = 6$ | 18. 9, 8, 72<br>$9 \times 8 = 72$<br>$8 \times 9 = 72$<br>$72 \div 9 = 8$<br>$72 \div 8 = 9$ | 19. 5, 4, 20<br>$5 \times 4 = 20$<br>$4 \times 5 = 20$<br>$20 \div 4 = 5$<br>$20 \div 5 = 4$ | 20. 6, 8, 48<br>$6 \times 8 = 48$<br>$8 \times 6 = 48$<br>$48 \div 6 = 8$<br>$48 \div 8 = 6$ |

## Reteaching 85

Name \_\_\_\_\_

36 snowflakes in all  
Groups of 9  
How many groups of 9 are there?

36 snowflakes in all  
9 equal groups  
How many are in each group?

$36 \div 9 = 4$  or  $9 \overline{)36}$   
There are 4 groups of 9 in 36.

$36 \div 9 = 4$  or  $9 \overline{)36}$   
There are 4 snowflakes in each of 9 equal groups.

Divide. Color the shape for each answer.

| Color  | Answer      |
|--------|-------------|
| Red    | 2 or 3 or 4 |
| Yellow | 5 or 6 or 7 |
| Blue   | 8 or 9      |

How many cubes do you see?  
Turn the paper. Count again.



## Assignment Guide

|          |             |
|----------|-------------|
| basic    | 1–42, 48–49 |
| average  | 1–46, 48–49 |
| enriched | 1–49        |

**More Practice Set 85,**  
page 382

## Follow-Up

**Extra Practice** Have students play the game described on pages 140–141 using division facts through 9.

**Reteaching** Have students complete their files of division basic facts.

**Enrichment** Have students make up five lines of numbers with hidden facts. Each line should have at least six numbers evenly spaced. Three of those numbers should be written so as to form a division basic fact when a division sign and an equal sign are placed correctly. Students then exchange their papers and put in the correct signs and circle the fact.

28 [÷] 4 [=] 7    10    53    6  
7    22    1    18 [÷] 2 [=] 9

## Computer Assisted Instruction

Mathematics Courseware Series

- Division 1, Activity 6
- Mathematics Action Games
- Star Maze, Standard Level

## Daily Maintenance

**Mental Math** Encourage students to do these exercises mentally.

- |                      |                       |
|----------------------|-----------------------|
| 1. $2 \times 4$ [8]  | 2. $4 \times 8$ [32]  |
| 3. $7 \times 1$ [7]  | 4. $5 \times 5$ [25]  |
| 5. $5 \times 9$ [45] | 6. $7 \times 9$ [63]  |
| 7. $8 \times 3$ [24] | 8. $0 \times 7$ [0]   |
| 9. $9 \times 4$ [36] | 10. $4 \times 3$ [12] |

## Answers, page 229

- |                      |                      |
|----------------------|----------------------|
| g. $3 \times 6 = 18$ | h. $8 \times 9 = 72$ |
| $6 \times 3 = 18$    | $9 \times 8 = 72$    |
| $18 \div 3 = 6$      | $72 \div 8 = 9$      |
| $18 \div 6 = 3$      | $72 \div 9 = 8$      |
| i. $2 \times 4 = 8$  | j. $5 \times 5 = 25$ |
| $4 \times 2 = 8$     | $25 \div 5 = 5$      |
| $8 \div 2 = 4$       |                      |
| $8 \div 4 = 2$       |                      |

- k.  $1 \times 3 = 3$   
 $3 \times 1 = 3$   
 $3 \div 1 = 3$   
 $3 \div 3 = 1$

Answers are continued on page 239 of this Teacher's edition.

- b. These four number sentences make up a family of facts. The numbers used are 7, 9, and 63.

$$\begin{array}{l} 7 \times 9 = 63 \quad 63 \div 7 = 9 \\ 9 \times 7 = 63 \quad 63 \div 9 = 7 \end{array}$$

- c. This family of facts has only two number sentences. It uses only two numbers, 9 and 3.

$$\begin{array}{l} 3 \times 3 = 9 \\ 9 \div 3 = 3 \end{array}$$

**Try** Divide.

|                      |                       |                       |                |                |                |
|----------------------|-----------------------|-----------------------|----------------|----------------|----------------|
| a. $9 \overline{)9}$ | b. $9 \overline{)54}$ | c. $9 \overline{)27}$ | d. $72 \div 9$ | e. $18 \div 9$ | f. $81 \div 9$ |
|----------------------|-----------------------|-----------------------|----------------|----------------|----------------|

Write a family of facts using the given numbers. **See margin.**

- |             |             |            |          |         |
|-------------|-------------|------------|----------|---------|
| g. 3, 6, 18 | h. 9, 72, 8 | i. 8, 4, 2 | j. 25, 5 | k. 1, 3 |
|-------------|-------------|------------|----------|---------|

**Practice** Divide.

|                        |                        |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1. $9 \overline{)36}$  | 2. $9 \overline{)0}$   | 3. $9 \overline{)18}$  | 4. $9 \overline{)27}$  | 5. $9 \overline{)54}$  | 6. $9 \overline{)72}$  |
| 7. $9 \overline{)45}$  | 8. $9 \overline{)81}$  | 9. $9 \overline{)9}$   | 10. $9 \overline{)63}$ | 11. $8 \overline{)72}$ | 12. $5 \overline{)15}$ |
| 13. $7 \overline{)28}$ | 14. $4 \overline{)36}$ | 15. $6 \overline{)42}$ | 16. $1 \overline{)9}$  | 17. $2 \overline{)12}$ | 18. $3 \overline{)9}$  |
| 19. $27 \div 9$        | 20. $24 \div 4$        | 21. $18 \div 9$        | 22. $49 \div 7$        | 23. $4 \div 2$         | 24. $40 \div 8$        |
| 25. $36 \div 6$        | 26. $63 \div 9$        | 27. $5 \div 1$         | 28. $9 \div 9$         | 29. $27 \div 3$        | 30. $45 \div 9$        |
| 31. $2 \div 2$         | 32. $81 \div 9$        | 33. $32 \div 8$        | 34. $54 \div 9$        | 35. $36 \div 9$        | 36. $35 \div 5$        |

37. Explain why you would or would not use a calculator to divide in Exercises 1–36. **Answers may vary.**

**In general, mental math should be used when possible.**

Write a family of facts using the given numbers. **See margin.**

- |              |              |              |              |              |
|--------------|--------------|--------------|--------------|--------------|
| 38. 2, 7, 14 | 39. 4, 16    | 40. 5, 6, 30 | 41. 8, 3, 24 | 42. 5, 9, 45 |
| 43. 64, 8    | 44. 8, 56, 7 | 45. 6, 2, 3  | 46. 4, 1     | 47. 9, 0     |

**Apply** Solve each problem.

48. Over 100 players were in a baseball playoff. John said there were more than 9 teams. Is John's statement true? Explain why or why not. **See Using the Pages.**
49. How many basketball teams of 5 players each can be formed from 35 players?  
**7 teams**

More Practice Set 85, page 382 **229**

## Enrichment 85

Name \_\_\_\_\_ E85

**Try It Another Way**

You can use multiplication to find the factors of a number.

Find the factors of 12.

1  $\times$  12 = 12    1 and 12 are factors of 12.

2  $\times$  6 = 12    2 and 6 are factors of 12.

3  $\times$  4 = 12    3 and 4 are factors of 12.

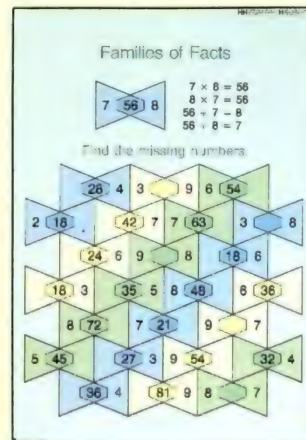
1. Find all the factors of the numbers 1 through 20. List the factors in the table.

| Number | Factors     | Number | Factors            |
|--------|-------------|--------|--------------------|
| 1      | 1           | 11     | 1, 11              |
| 2      | 1, 2        | 12     | 1, 2, 3, 4, 6, 12  |
| 3      | 1, 3        | 13     | 1, 13              |
| 4      | 1, 2, 4     | 14     | 1, 2, 7, 14        |
| 5      | 1, 5        | 15     | 1, 3, 5, 15        |
| 6      | 1, 2, 3, 6  | 16     | 1, 2, 4, 8, 16     |
| 7      | 1, 7        | 17     | 1, 17              |
| 8      | 1, 2, 4, 8  | 18     | 1, 2, 3, 6, 9, 18  |
| 9      | 1, 3, 9     | 19     | 1, 19              |
| 10     | 1, 2, 5, 10 | 20     | 1, 2, 4, 5, 10, 20 |

Numbers with exactly 2 different factors are called **prime numbers**.

2. List the prime numbers between 1 and 20. **2, 3, 5, 7, 11, 13, 17, 19**

## Additional Resource 85



## Math Poster HH Families of Facts

Beginning at the top, by rows, the missing numbers are 7, 27, 9; 9, 6, 9, 24; 4, 72, 3; 6, 7, 6, 6; 9, 3, 63; 9, 9, 6, 8; 9, 9, 56.



## Objective 86

Solve multiple-step problems.

### Lesson Theme

Recreation: Games

### Materials

- Common objects

## Introduction

**Motivational Situation** Ask students to tell about favorite outdoor or play-ground games such as tag or hide-and-seek. Ask numerical questions about the games, such as the number of players, the number of points needed to win, or if counting is necessary. Have students suggest problems from the information given. For example, Sue must count to 25 in hide-and-seek. She just said 17. How many more numbers must she count? [ $25 - 17 = 8$ ]

## Using the Pages

**Teach** Read and discuss each step of the example. Under *Plan* students should note that they must perform two operations. Under *Look Back* ask if there is another way to do the problem. [Subtract twice.]

**Try** In Problem a, students either add twice or add and multiply. Problem b involves addition and division.

**Error Analysis** Watch for students who only do part of the problem. Use the method described in **Reteaching 86** with students who make this error.

**Apply Problem Solving** Note that there is more than one way to solve Problems 1, 2, and 5.

**Draw a picture** Suggest that students draw a picture to help solve Problem 8.

**Use logical thinking** In Problem 9, students must realize that there are 2 wheels per bike and 8 wheels per pair of roller skates.

**Additional problem** Give students tables like those shown below. Ask students to complete the table and write the rule they used.

|    | $[\div 7]$ |    | $[\div 9]$ |
|----|------------|----|------------|
| 7  | [1]        | 18 | [2]        |
| 21 | [3]        | 36 | [4]        |
| 35 | 5          | 54 | [6]        |
| 49 | [7]        | 9  | [1]        |
| 63 | [9]        | 45 | 5          |
| 56 | [8]        | 27 | [3]        |
| 42 | [6]        | 81 | 9          |
| 28 | [4]        | 63 | [7]        |
| 14 | 2          | 72 | [8]        |

## Problem Solving

## Multiple-Step Problems

In the game of marbles, the object is to knock marbles out of the ring by hitting them with another marble.

**Read** Myra and Thomas started a game with 16 marbles in the ring. Myra knocked 5 marbles out. Thomas knocked out 4 marbles. How many marbles were left in the ring?

### Plan

First, add to find how many marbles in all were knocked out. Then subtract the sum from the number of marbles in the ring at the start of the game to find how many marbles were left.

|              |                                  |                           |
|--------------|----------------------------------|---------------------------|
| <b>Solve</b> | Number of marbles<br>knocked out | Number of<br>marbles left |
|              | 5                                | 16                        |
|              | + 4                              | - 9                       |
|              | 9                                | 7                         |

**Answer** There were 7 marbles left in the ring.

### Look Back

Add the number of marbles left in the ring to the number of marbles knocked out of the ring.

$$\begin{array}{r} \text{In} \quad \text{Out} \quad \text{Started with} \\ 7 + 4 + 5 = 16 \end{array}$$

The game started with 16 marbles, so the answer checks.

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## Practice 86

Name \_\_\_\_\_ P86

Solve each problem.

1. Wendy had 8 penguin stickers and 6 whale stickers. She gave a friend 3 of each kind. How many stickers did she have left?

8 stickers

2. Paul had 12 pencils. Stacey had 6 more pencils than Paul. Mark had 2 fewer pencils than Stacey. How many pencils did Mark have?

16 pencils

3. Gloria delivers 217 Sunday newspapers. Barry delivers 171 Sunday papers. If they each add 10 newspapers to their routes, how many newspapers would be delivered in all?

408 newspapers

4. A group of children have 7 picnic baskets. Each basket has 2 apples in it. They also have 5 apples in a plastic bag. How many apples are there in all?

19 apples

5. 52 blue and white candles were on a birthday cake. 8 blue candles and 3 white candles were removed. How many candles were left?

41 candles

6. 315 people visited the zoo on Friday, 407 on Saturday, and 900 on Sunday. How many more people visited the zoo on Sunday than on Friday and Saturday together?

178 people

7. 36 purple pencils and 9 green pencils were put into 5 boxes. Each box had the same number of pencils. How many pencils were in each box?

9 pencils

8. The Bears had 18 points and the Rams had 21 points. The Bears scored a touchdown for 6 points and won the game. By how many points did the Bears win?

3 points

## Reteaching 86

Name \_\_\_\_\_ R86

David had 23 trading cards. He gave Dina 8 cards. He put the remaining cards in 3 equal stacks. How many cards were in each stack?

Step 1.  $23 - 8 = 15$

Step 2.  $15 \div 3 = 5$

There are 5 cards in each stack.

Solve each problem.

1. There were 15 stickers on a sheet. Laura used 2 on Monday. She used 4 more on Tuesday. How many stickers were left?

9 stickers

2. Paul had 2 boxes of paints. Each box had 6 colors in it. He found 3 more colors. How many colors did he have in all?

15 colors

3. There were 3 packages of stamps with 4 stamps in each package. Joe used 7 stamps to finish his collection. How many stamps were left?

5 stamps

4. A store had 14 model cars. On Monday they sold 3 and on Tuesday they sold 5. How many were left?

6 model cars

Do the problem in two steps.





**Try** Solve each problem.

- a. If 2 children each had 6 rainbow marbles and 3 cat's eye marbles, how many marbles did they have altogether?

**18 marbles**

**Apply** Solve each problem.

1. Felipa put 10 jacks on the floor. She picked up 3 jacks on her first try and 3 more on the next. How many jacks were left on the floor?

**4 jacks**

3. There were 13 children playing *Tag* and 2 teams of 8 children each playing *Steal the Flag*. How many children were playing these two games?

**29 children**

5. There were 32 checkers on the playing board. If 7 red checkers and 8 black checkers were removed, how many checkers were left?

**17 checkers**

7. On her first turn Maria went ahead 3 spaces from Start. On her next turns she went ahead 6 spaces, ahead 4 spaces, and back 5 spaces. Then how far was she from Start?

**8 spaces from Start**

- b. There were 15 girls and 9 boys. They made 4 equal teams. How many children were on each team?

**6 children**

2. Leona jumped rope 14 times. Mary jumped 5 times fewer than Leona. Nancy jumped 4 times fewer than Mary. How many times did Nancy jump?

**5 times**

4. Fred had 14 marbles. He put 2 of them into his pocket and then separated the remaining marbles into groups of 3. How many groups of 3 did Fred make?

**4 groups**

6. The Pirates had 6 runs, and the Indians had 7 runs. The Pirates then scored 3 more runs and won the game. By how many runs did the Pirates win?

**2 runs**

8. There are 30 children to play basketball. Each team has 5 players. How many games will be played if each team plays only one game?

**3 games**

9. There were 3 children riding bicycles and 5 children roller skating. How many wheels were there in all?

**46 wheels**

10. **Write a problem.** Write a problem that can be solved using addition and multiplication. Then solve the problem.

**Answers will vary.**

## Assignment Guide

basic 1-7, 10

average 1-7, 10

enriched 1-10

**More Practice Set 86, page 382**

## Follow-Up

**Extra Practice** Have students solve these problems.

- There are 8 girls and 4 boys. How many teams of 6 volleyball players can they make? [2]
- There were 3 teams with 5 players in each. If 4 players went home, how many players were left? [11]
- Tim scored 2 points for each of the 9 basketball shots he made and 3 points in free throws. How many points did he score in all? [21]

## Reteaching Using Concrete Materials

Have students use objects to illustrate some of the problems.

**Enrichment Write a problem** Have students make up multiple-step problems about games. These can then be shared with other classmates to solve.

## Calculator

Have students fill in the missing digits. After they have completed a few exercises, encourage them to discuss their strategies.

- $54 \times 27 = 339,207$  [ $541 \times 627$ ]
- $42 \times 98 = 339,948$  [ $426 \times 798$ ]
- $19 \times 13 = 109,746$  [ $819 \times 134$ ]
- $42 \times 34 = 83,974$  [ $242 \times 347$ ]
- $18 \times 32 = 137,522$  [ $418 \times 329$ ]
- $71 \times 25 = 230,750$  [ $710 \times 325$ ]
- $11 \times 22 = 24,642$  [ $111 \times 222$ ]
- $52 \times 21 = 140,180$  [ $652 \times 215$ ]
- $53 \times 06 = 164,016$  [ $536 \times 306$ ]
- $25 \times 32 = 264,000$  [ $825 \times 320$ ]

## Enrichment 86

Name \_\_\_\_\_ E86

**From the Greenhouse**

Sandy and her father grow flowers and vegetables in a greenhouse.

Solve each problem.

1. Sandy picked 48 green peppers and packaged them in cartons of 6. Each carton sold for \$1.39. How much money did they get for the peppers?

**\$11.12**

2. That same day, they sold 45 tomatoes in cartons of 5 each. Each carton sold for \$2.50. How much money did they get for the tomatoes?

**\$22.50**

4. On another day, Sandy picked 40 pounds of potatoes. If 5-pound bags sell for \$0.80 and 10-pound bags sell for \$1.50, how much more would they get if they sold only 5-pound bags?

**\$0.40**

6. One week her father sold 11 cactus plants for a total of \$33.00. He also sold 5 ivy plants for a total of \$30.00. Which costs more, one cactus plant or one ivy plant?

**1 ivy plant**

**SANDY and DAD Greenhouse**

vegetables & flowers

Tomatoes **\$11.38**

Sandy sells daisies in bundles of 12 at \$4.20 per bundle. Sandy sold 64 daisies. How much money did she get for the daisies?

**\$29.40**

## Additional Resource 86

Name \_\_\_\_\_ Additional Resource 86

**Project Division Checkers**

Materials needed: two sets of colored markers

Number of players: 2

Set up the game board with markers as you would for a game of checkers.

Play this game like checkers except:

- You may move your marker only if you give the correct answer to the exercise in the space to which you wish to move.
- If you do not answer the exercise correctly, you lose a turn.

|        |        |        |        |
|--------|--------|--------|--------|
| 72 ÷ 8 | 54 ÷ 9 | 49 ÷ 7 | 56 ÷ 8 |
| 18 ÷ 2 | 14 ÷ 7 | 10 ÷ 2 |        |
| 36 ÷ 9 | 24 ÷ 6 | 30 ÷ 5 | 40 ÷ 8 |
| 42 ÷ 6 | 21 ÷ 3 | 35 ÷ 7 |        |
| 32 ÷ 8 | 26 ÷ 7 | 27 ÷ 3 | 45 ÷ 5 |
| 16 ÷ 8 | 12 ÷ 2 | 8 ÷ 4  |        |
| 81 ÷ 9 | 64 ÷ 8 | 48 ÷ 6 | 63 ÷ 7 |

## Daily Maintenance

- $43 \times 16$  [688]
- $78 \times 12$  [936]
- $53 \times 27$  [1,431]
- $65 \times 19$  [1,235]
- $97 \times 55$  [5,335]
- $87 \times 68$  [5,916]



## Using Problem-Solving Strategies

- Draw a diagram.
- Try and check.
- Make a table.

### Introduction

Students may use a variety of strategies to find the number of tables and stools that can be made from a given number of legs.

### Using the Pages

Point out that Lynn's father used up all of the legs.

Some students may draw diagrams to show all the possibilities. This is one of the possible solutions:



7 tables and 1 stool

Others may use *try and check*. For example, try 3 tables. Three tables will use 12 legs. That will leave 19 legs for stools. But with 19 legs, there will be 1 leg left over after making 6 stools. Next, try 4 tables. Four tables will use 16 legs. That will leave 15 legs for stools. With 15 legs, exactly 5 stools can be made. Therefore, Lynn's father could have made 4 tables and 5 stools.

Others might *make a table* listing the numbers of legs for different numbers of tables and stools. Then look for combinations of legs that add to 31.

| Number of Tables | Number of Legs Used |
|------------------|---------------------|
| 1                | 4                   |
| 2                | 8                   |
| 3                | 12                  |
| 4                | 16                  |
| 5                | 20                  |
| 6                | 24                  |
| 7                | 28                  |

| Number of Stools | Number of Legs Used | 31 | 31 | 31 |
|------------------|---------------------|----|----|----|
| 1                | 3                   |    |    |    |
| 2                | 6                   |    |    |    |
| 3                | 9                   |    |    |    |
| 4                | 12                  |    |    |    |
| 5                | 15                  |    |    |    |
| 6                | 18                  |    |    |    |
| 7                | 21                  |    |    |    |
| 8                | 24                  |    |    |    |
| 9                | 27                  |    |    |    |
| 10               | 30                  |    |    |    |

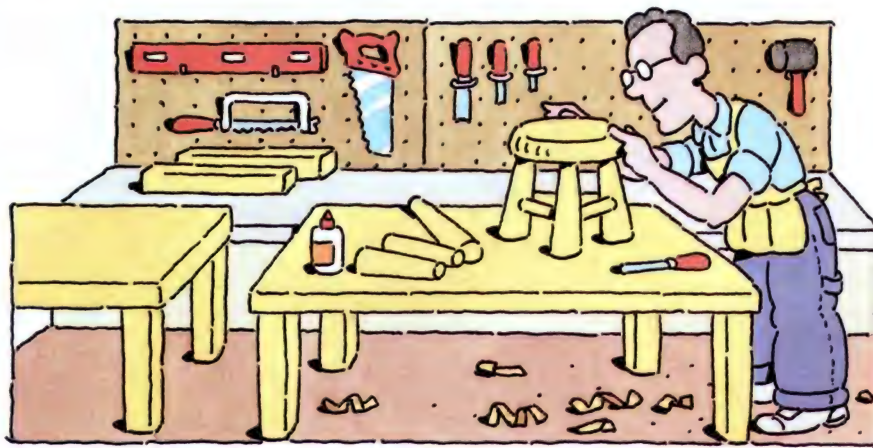
This shows the possible solutions: 7 tables and 1 stool, or 4 tables and 5 stools, or 1 table and 9 stools.

## Using Problem-Solving Strategies

Using Division

# HOW MANY LEGS?

Lynn's father works in a carpenter shop. He makes only 3-legged stools and 4-legged tables. At the end of one day, he had used 31 legs. *How many stools and how many tables did he make?*



Think about the strategies you have used to solve problems. A strategy which you have used before may help you with solving this problem. Choose one of these strategies and try to use it with this problem. After you have tried to solve the problem, answer the questions below.

1. Could Lynn's father have made exactly 2 tables? Why or why not? **No. Using 8 legs leaves 23 legs for 7 stools with 2 legs left over.**
2. Could Lynn's father have made exactly 1 table? Why or why not? **Yes. Using 4 legs leaves 27 legs for exactly 9 stools.**
3. Is there more than one solution to this problem? **Yes**

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In Problem 7, students consider the possibilities with 43 legs. Here is another type of table that students may use:

| Number of tables | Number of legs | Number of legs left | Stools with no legs left |
|------------------|----------------|---------------------|--------------------------|
| 1                | 4              | 39                  | 13                       |
| 2                | 8              | 35                  | —                        |
| 3                | 12             | 31                  | —                        |
| 4                | 16             | 27                  | 9                        |
| 5                | 20             | 23                  | —                        |
| 6                | 24             | 19                  | —                        |
| 7                | 28             | 15                  | 5                        |
| 8                | 32             | 11                  | —                        |
| 9                | 36             | 7                   | —                        |
| 10               | 40             | 3                   | 1                        |

The possible solutions for Problem 7 are: 1 table and 13 stools, 4 tables and 9 stools, 7 tables and 5 stools, or 10 tables and 1 stool.

A similar table for Problem 8 (44 legs), is given below:

| Number of tables | Number of legs | Number of legs left | Stools with no legs left |
|------------------|----------------|---------------------|--------------------------|
| 1                | 4              | 40                  | —                        |
| 2                | 8              | 36                  | 12                       |
| 3                | 12             | 32                  | —                        |
| 4                | 16             | 28                  | —                        |
| 5                | 20             | 24                  | 8                        |
| 6                | 24             | 20                  | —                        |
| 7                | 28             | 16                  | —                        |
| 8                | 32             | 12                  | 4                        |
| 9                | 36             | 8                   | —                        |
| 10               | 40             | 4                   | —                        |
| 11               | 44             | 0                   | 0                        |

The possible solutions for Problem 8 are: 2 tables and 12 stools, 5 tables and 8 stools, 8 tables and 4 stools, or 11 tables and no stools.



## CALCULATOR

4. What is the largest number of tables that Lynn's father could have made?

**7 tables**

5. Look at your answer to Problem 4. What numbers less than that will not work for the number of tables?

**6, 5, 3, 2, 0 tables**

6. How many tables and how many stools could Lynn's father have made?

**7 tables, 1 stool;  
4 tables, 5 stools;  
1 table, 9 stools**

7. If Lynn's father used 43 legs, how many tables and how many stools could he have made?

**See Using the Pages.**

8. If Lynn's father used 44 legs, how many tables and how many stools could he have made?

**See Using the Pages.**

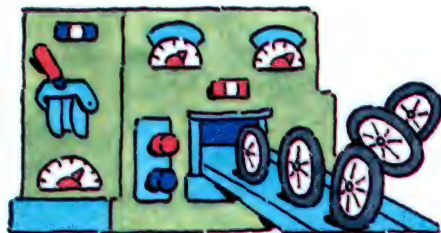
9. How are the answers with 44 legs related to the answers with 43 legs?

**See Using the Pages.**

Use the method that you used above to solve the following problem.

10. You work in a factory where you build bicycles and tricycles. Suddenly, the wheel-building machine shoots out 32 wheels. How many bicycles and tricycles can you build?

**See margin.**



Find  $24 \div 8$ .

Use repeated subtraction to find the quotient.

To find  $24 \div 8$ , count how many 8s can be subtracted from 24.

| Press                    | Display |
|--------------------------|---------|
| 24 $\square$ 8 $\square$ | 16      |
| $\square$ 8 $\square$    | 8       |
| $\square$ 8 $\square$    | 0       |

How many times did you subtract? 3

$$24 \div 8 = 3$$

Quotient

Divide using repeated subtraction. Some quotients will have two digits.

- |                  |                  |
|------------------|------------------|
| 1. $72 \div 9$   | 2. $35 \div 5$   |
| <b>8</b>         | <b>7</b>         |
| 3. $12 \div 6$   | 4. $18 \div 2$   |
| <b>2</b>         | <b>9</b>         |
| 5. $28 \div 4$   | 6. $9 \div 3$    |
| <b>7</b>         | <b>3</b>         |
| 7. $8 \div 1$    | 8. $49 \div 7$   |
| <b>8</b>         | <b>7</b>         |
| 9. $48 \div 8$   | 10. $4 \div 4$   |
| <b>6</b>         | <b>1</b>         |
| 11. $72 \div 6$  | 12. $91 \div 7$  |
| <b>12</b>        | <b>13</b>        |
| 13. $80 \div 8$  | 14. $42 \div 3$  |
| <b>10</b>        | <b>14</b>        |
| 15. $16 \div 1$  | 16. $99 \div 9$  |
| <b>16</b>        | <b>11</b>        |
| 17. $30 \div 2$  | 18. $64 \div 4$  |
| <b>15</b>        | <b>16</b>        |
| 19. $100 \div 5$ | 20. $12 \div 12$ |
| <b>20</b>        | <b>1</b>         |

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## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–8  |
| average  | 1–9  |
| enriched | 1–10 |

### Calculator, page 233

Note that using repeated subtraction to find the quotient is equivalent to finding the number of groups of 8 in 24. You can illustrate the problem with objects, removing a group of 8 with each calculation. Explain to the students that at the circuit level, electronic calculators and computers can only add or subtract. Thus, they multiply by repeated addition and divide by repeated subtraction.

### Computer Assisted Instruction

Mathematics Courseware Series

- Division 1, Activity 9

For Problem 9, each solution to the 44-leg problem has 1 more table and 1 less stool than a solution to the 43-leg problem.

### Daily Maintenance

**Mental Math** Encourage students to find the products mentally.

- |                    |          |
|--------------------|----------|
| 1. $8 \times 30$   | [240]    |
| 2. $40 \times 9$   | [360]    |
| 3. $700 \times 5$  | [3,500]  |
| 4. $80 \times 90$  | [7,200]  |
| 5. $200 \times 80$ | [16,000] |
| 6. $6 \times 600$  | [3,600]  |

### Answers, page 233

10. 1 bicycle and 10 tricycles;  
4 bicycles and 8 tricycles;  
7 bicycles and 6 tricycles;  
10 bicycles and 4 tricycles;  
13 bicycles and 2 tricycles;  
16 bicycles and 0 tricycles



## Objective 87 (Target Objective)

Divide a two-digit number by a one-digit number to get a one-digit quotient with a remainder.

### Lesson Theme

Recreation: Postcards

### Vocabulary

Dividend, remainder

### Materials

- Counters (Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Divide.

- $36 \div 4$  [9]
- $40 \div 5$  [8]
- $15 \div 3$  [5]
- $72 \div 9$  [8]
- $54 \div 6$  [9]
- $52 \div 1$  [52]
- $18 \div 2$  [9]
- $49 \div 7$  [7]
- $40 \div 8$  [5]
- $0 \div 6$  [0]

## Using the Pages

### Teach Using Concrete Materials

In Example A, students discover that it is not always possible to divide a number of objects into groups with the same number of objects in each group. After students have had time to work in groups, read through Example A with the class and work through each step. Point out that a remainder is always less than the divisor. In Example C, students should see that the answer 6 R2 is reasonable since it is greater than 6 and less than 7, thus falling within the range established.

**Reading and Writing Mathematics** Discuss the new terms *dividend* and *remainder* presented in Example A.

Other teaching examples:

$$29 \div 5 [5 \text{ R}4] \quad 31 \div 4 [7 \text{ R}3]$$

**Practice** Remind students that a remainder of zero need not be written in the answer.

### Apply Problem Solving

#### Interpreting the Remainder

In Problem 28, students should realize that in order to find the unit price of the postcards, the total price of 95¢ should be divided by the number of postcards, 6. The exact answer, 15 R5, is rounded to 16¢ since there are no fractional cents.

**Calculator** Problems 29 and 30 will work only if students' calculators have a constant function. If not, they will need to enter  $\square$  each time. Once students understand that division is repeated subtraction, ask them which operation is repeated addition. [Multiplication]

## Remainders

Work in groups. Use your counters. **See Using the Pages for a discussion of these examples.**

- A.** Becky has 50 cents. Postcards cost 8 cents each. How many postcards can she buy? Will she have any money left over? If so, how much?

$$\text{Find } 50 \div 8.$$

Use 50 counters. Put them in groups of 8.

What does each group of 8 represent? **1 postcard**  
How many groups are there? How many **6 groups**  
counters are left over? **2 counters**

The number left over is called the *remainder*. The answer to  $50 \div 8$  is 6, remainder 2. This can be written 6 R2.

$$\begin{array}{r} \text{Quotient} \rightarrow 6 \text{ R}2 \leftarrow \text{Remainder} \\ \text{Divisor} \rightarrow 8 \overline{)50} \leftarrow \text{Dividend} \end{array}$$

Becky can buy **6** postcards.  
She will have **2** cents left over.

- B.** Becky's father bought 36 stamps for postcards. He divided them evenly among his 5 children. How many stamps did each child get? How many stamps were left over?

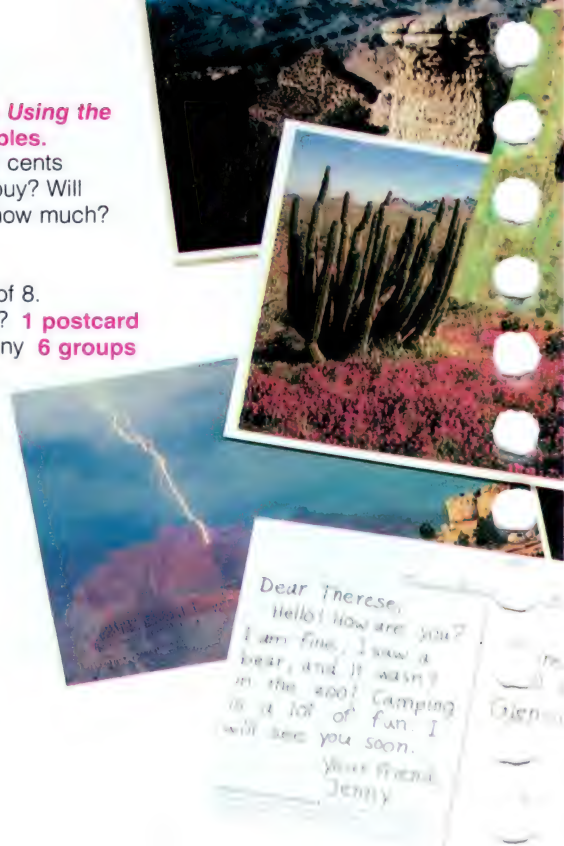
$$\text{Find } 36 \div 5.$$

Use 36 counters and put them into 5 equal groups. Begin by taking 5 counters and putting one in each group. Then take 5 more and put one in each group. How many times can you do this? When must you stop?

**7 times; stop when you cannot take 5 counters.**

How many counters are in each group? What does this number represent? How many counters are left over? What does this number represent? **7 counters; 7 stamps; 1 counter is left over; 1 stamp**

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- C.** You can check the reasonableness of your answer to a division problem by estimating a *range*. To find a range for the answer to  $50 \div 8$ , recall that  $48 \div 8$  is 6 and  $56 \div 8$  is 7. Since 50 is between 48 and 56, you can say  $50 \div 8$  is between 6 and 7.

You found the answer to  $50 \div 8$  in Example A. Explain why it is reasonable.

## Practice 87

Name: \_\_\_\_\_ P87

Why can a nose never be twelve inches long?

To find out, divide. Each time an answer is given in the code, write the letter for that exercise. One answer is not used.

|                                  |                                  |                                  |                          |
|----------------------------------|----------------------------------|----------------------------------|--------------------------|
| 1. $5 \overline{)37}$ L          | 2. $3 \overline{)10}$ I          | 3. $6 \overline{)21}$ T          | 4. $7 \overline{)45}$ B  |
| 5. $9 \overline{)25}$ O          | 6. $2 \overline{)19}$ E          | 7. $8 \overline{)35}$ E          | 8. $7 \overline{)26}$ H  |
| 9. $6 \overline{)38}$ F          | 10. $5 \overline{)14}$ A         | 11. $7 \overline{)61}$ T         | 12. $9 \overline{)43}$ O |
| 13. $2 \overline{)13}$ B         | 14. $5 \overline{)41}$ N         | 15. $6 \overline{)56}$ W         | 16. $5 \overline{)29}$ U |
| 17. $38 \div 7 = 5 \text{ R}3$ O | 18. $19 \div 8 = 2 \text{ R}3$ T | 19. $29 \div 4 = 7 \text{ R}1$ O |                          |

Because: T H E N I T  
3 R3 3 R5 4 R3 8 R1 3 R1 8 R5

W O U L D B E A F O O T  
9 R2 7 R1 5 R4 7 R2 5 R3 6 R3 9 R1 2 R4 6 R2 2 R7 4 R7 2 R3

## Reteaching 87

Name: \_\_\_\_\_ R87

Find  $27 \div 4$ .

Divide:  $4 \overline{)27}$

Subtract and compare:  $6 \text{ R}3$   
 $4 \overline{)27}$   
 $24$   
 $3$  remainder  
4 does not go into 3

How many 4s in 27? 6  
Write 6 above the 7.  
Multiply,  $6 \times 4 = 24$

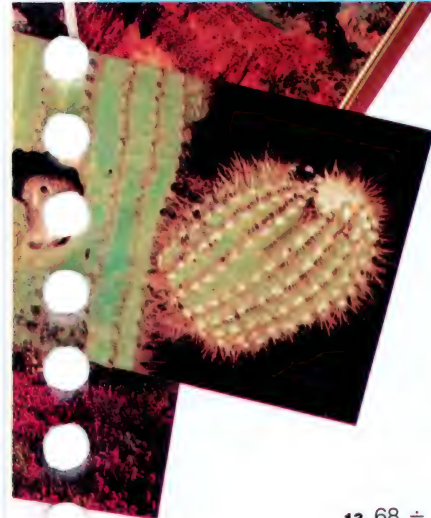
On what mountain was the greatest wind speed recorded?

Divide. Then match each letter to its answer below.

|                         |                         |                         |
|-------------------------|-------------------------|-------------------------|
| 1. $3 \overline{)19}$ N | 2. $6 \overline{)27}$ H | 3. $4 \overline{)11}$ O |
| 4. $2 \overline{)17}$ S | 5. $7 \overline{)32}$ G | 6. $9 \overline{)28}$ I |
| 7. $6 \overline{)38}$ W | 8. $8 \overline{)67}$ T | 9. $5 \overline{)12}$ A |

MT. W A S H I N G T O N  
6 R2 2 R2 8 R1 4 R3 3 R1 6 R1 4 R4 8 R3 2 R3 6 R1





**Try** Work in groups. Use counters to divide. Explain to another student why each answer is reasonable.

a.  $3 \overline{)16}$  **5 R1**      b.  $6 \overline{)42}$  **7**      c.  $47 \div 9$  **5 R2**

**Practice** Work in groups. Use counters to divide.

1.  $5 \overline{)42}$  **8 R2**      2.  $2 \overline{)11}$  **5 R1**      3.  $4 \overline{)24}$  **6**      4.  $8 \overline{)46}$  **5 R6**  
 5.  $5 \overline{)23}$  **4 R3**      6.  $6 \overline{)39}$  **6 R3**      7.  $3 \overline{)26}$  **8 R2**      8.  $2 \overline{)17}$  **8 R1**  
 9.  $3 \overline{)15}$  **5**      10.  $8 \overline{)56}$  **7**      11.  $7 \overline{)59}$  **8 R3**      12.  $9 \overline{)75}$  **8 R3**

13.  $68 \div 8$  **8 R4**      14.  $33 \div 4$  **8 R1**      15.  $87 \div 9$  **9 R6**      16.  $39 \div 7$  **5 R4**  
 17.  $18 \div 5$  **3 R3**      18.  $23 \div 6$  **3 R5**      19.  $48 \div 7$  **6 R6**      20.  $57 \div 9$  **6 R3**  
 21.  $9 \div 2$  **4 R1**      22.  $63 \div 9$  **7**      23.  $49 \div 6$  **8 R1**      24.  $10 \div 5$  **2**

**Apply** Solve each problem.

25. Sam bought a postcard for 21 cents. Then he decided to buy 5 more. How much did he spend for all the postcards?  
**\$1.26**
27. If 25 people got on a sightseeing bus and 4 people sat in each row, how many rows were filled? How many people were in another row?  
**6 rows; 1 person**
29. **Calculator** On your calculator, press  $50 \div 8 =$ . Continue pressing  $=$  until the display shows a number less than 8. How many times did you press  $=$ ? **6 times** Compare this with the answer in Example A. Work with other students to make a generalization. Then test your generalization, using some of the Practice exercises.  
**Division is repeated subtraction. See Using the Pages.**
30. Explain to another student how to find  $125 \div 13$  by using only the operation of subtraction.  
**See margin.**

Using Problem-Solving Strategies, page 425  
More Practice Set 87, page 383 **235**

## Assignment Guide

|          |                                 |
|----------|---------------------------------|
| basic    | 1–24 odd or even, 25, 27, 29–30 |
| average  | 1–24 odd, 25–27, 29–30          |
| enriched | 1–24 even, 25–30                |

**More Practice Set 87, page 383**

## Follow-Up

**Extra Practice** Have students play the game described on pages 254–255.

## Computer Assisted Instruction

Mathematics Courseware Series

- Division 1, Activities 7, 8
- Mathematics Action Games
- Star Maze, Advanced Level

## Calculator

- When a number is divided by 6, the remainder is 4. When the same number is divided by 5, the remainder is 3. Find some numbers for which this is true. [28, 58, 88, 118, ...]
- When a number is divided by 7, the remainder is 3. When the same number is divided by 8, the remainder is 5. Find some numbers for which this is true. [45, 101, 157, ...]

## Daily Maintenance

- $5 \times 216$  [1,080]
- $3 \times 628$  [1,884]
- $2 \times 3,732$  [7,464]
- $5 \times 7,161$  [35,805]
- $4 \times 4,241$  [16,964]

## Answers, page 235

30. Answers will vary. A sample is given.

125  $\div$  13 could be asking how many groups of 13 are in 125. Subtract 13 repeatedly, counting the number of times you subtracted. That number is the quotient. Stop subtracting when the number is less than 13. That number is the remainder.

$$\begin{array}{r} 125 \\ - 13 \\ \hline 112 \\ - 13 \\ \hline 99 \\ - 13 \\ \hline 86 \\ - 13 \\ \hline 73 \\ - 13 \\ \hline 60 \\ - 13 \\ \hline 47 \\ - 13 \\ \hline 34 \\ - 13 \\ \hline 21 \\ - 13 \\ \hline 8 \end{array}$$
 Subtract 13 repeatedly—9 times.  
 8 remainder    125  $\div$  13 is 9 R8.

**Using Problem-Solving Strategies, page 425**

## Enrichment 87

Name \_\_\_\_\_ E87

**Let's Find Out.**

What is the oldest living tree?

To find out, divide. Find each answer below. Write the letter for that exercise.

1.  $36 \div 6$  **6** R    2.  $21 \div 3$  **7** R    3.  $54 \div 10$  **5 R4** S

4.  $9 \overline{)67}$  **7 R4** T    5.  $8 \overline{)51}$  **6 R3** L    6.  $7 \overline{)49}$  **7** C

7.  $56 \div 7$  **8** E    8.  $49 \div 5$  **9 R4** O    9.  $15 \div 4$  **3 R3** N

10.  $5 \overline{)38}$  **7 R3** E    11.  $4 \overline{)22}$  **5 R2** P    12.  $7 \overline{)64}$  **9 R1** I

13.  $16 \div 4$  **4** N    14.  $4 \overline{)26}$  **6 R2** B    15.  $13 \div 3$  **4 R1** E

**B R I S T L E**  
 6 R2 6 9 R1 5 R4 7 R4 6 R3 4 R1

**C O N E**    **P I N E**  
 7 9 R4 3 R3 7 R3    5 R2 9 4 8

## Additional Resource 87

Name \_\_\_\_\_ Additional Resource 87

**Computer BASIC: Printing in Columns**

A comma in a PRINT statement tells the computer to print the output in columns. A comma at the end of a PRINT statement will place the output of the next PRINT statement on the same line.

Type each of these programs. Type RUN. Write the outputs.

1. 10 REM PRINT WITH COMMAS  
20 PRINT "STRETCH".  
30 PRINT "OUT".  
40 END

2. NEW  
10 PRINT "COLUMNS".  
20 PRINT "ONE".  
30 PRINT "TWO".  
40 END

**STRETCH OUT**      **COLUMNS:**  
**ONE TWO**

You can also put two or more items on the same PRINT line by separating them with commas.

Show what you think the output from this program will be. Check your answer on the computer.

PRINT 5, 10  
 5    10

3. NEW  
10 PRINT "NUMBERS", "QUOTIENT".  
20 PRINT "9, 3", 9/3  
30 PRINT "36, 9", 36/9  
40 PRINT "54, 9", 54/9  
50 END

**NUMBERS QUOTIENT**  
 9, 3      3  
 36, 9      4  
 54, 9      6

Columns can make your output easier to read.

Data printed in columns is called a table.



## Objective 88 (Target Objective)

Solve problems by choosing addition, subtraction, multiplication, or division.

### Lesson Theme

Recreation: Vacation

### Materials

- Tens, Units (Punchouts)
- Sets of 4 cards with operation signs

## Introduction

**Motivational Situation** Discuss favorite vacations with the students. Say that people often need to use mathematics on a vacation. Ask for examples of ways that addition, subtraction, multiplication, and division could be used on a vacation. [Multiplying to find the cost of a week's camping supplies; adding to find total mileage; subtracting to find amount of money left to spend; dividing to find average mileage per day]

## Using the Pages

**Teach** Review the five steps in problem solving. Then read and discuss the example. Discuss why division was chosen. Notice that the example shows division using counters. Students will be given the division algorithm in the next lesson (Chapter 9).

**Apply Problem Solving** Students will need their place-value materials to solve the problems that use the operation of division. (Problems 1, 3, 6, and 9).

Encourage students to estimate what an answer will be before computing.

**Choose the operation** Be sure students specify which operation they plan to use before solving each problem. Problems 1, 3, 6, and 9 involve division. (Problems 3 and 9 have remainders.) Problem 2 involves subtraction. Problems 4 and 7 involve addition. Problems 5 and 8 involve multiplication. Problem 10 is a multiple-step problem involving multiplication and addition.

**Additional problem** Have students work in groups of four. Give each group a set of 4 cards with one of the operation signs (+, -, ×, ÷) on each. Give each group two numbers, one one-digit number and one two-digit number, such as 24 and 8, or 62 and 9. Each student in the group draws a card and writes a problem involving the operation on the card using the numbers you gave them. Then have them share their problems with their classmates who must tell which operation should be used to solve the problem.

## Problem Solving Choose the Operation

The Andrews family brought 48 grapefruit home for their neighbors. They gave the same number of grapefruit to each of 8 neighbors. How many grapefruit did they give to each neighbor?

### Read

Facts: 48 grapefruit, same number to each of 8 neighbors

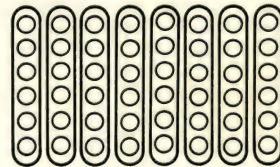
Find: Number given to each neighbor

### Plan

Since 48 grapefruit were separated into 8 equal groups, use division. Find  $48 \div 8$ .

### Solve

$$\begin{array}{r} 6 \\ 8 \overline{)48} \end{array}$$



8 groups of 6

### Answer

They gave each neighbor 6 grapefruit.

### Look Back

There were 8 groups with 6 grapefruit in each group.  $8 \times 6 = 48$ .



## Practice 88

Name \_\_\_\_\_ P88

Tell whether you would add, subtract, multiply, or divide. Then give the answer.

|  |   |
|--|---|
| 1. Mr. Camp bought 3 boxes of golf balls. Each box had 8 balls. How many golf balls did he buy in all?<br><div style="text-align: center;">Multiply<br/>24 golf balls</div>  | 2. Mrs. Jarvis bought golf balls in boxes of 4. She bought a total of 32 golf balls. How many boxes did she buy?<br><div style="text-align: center;">Divide<br/>8 boxes</div>   |
| 3. At the driving range, Dick bought 3 buckets of golf balls. Each bucket had 45 balls. How many golf balls did he buy in all?<br><div style="text-align: center;">Multiply<br/>135 golf balls</div>                             | 4. Jason collected 42 golf balls. He put 6 balls in each bag. How many bags did he use?<br><div style="text-align: center;">Divide<br/>7 bags</div>   |
| 5. Leslie took 94 shots for 18 holes of golf. Marta took 13 more shots than Leslie. How many shots did Marta take?<br><div style="text-align: center;">Add<br/>107 shots</div>   | 6. A team bought 72 golf balls to use for a tournament. If they bought the golf balls in boxes of 8, how many boxes did the team buy?<br><div style="text-align: center;">Divide<br/>9 boxes</div>                        |
| 7. The pro shop had 57 boxes of golf balls at the start of the week. At the end of the week, there were 18 boxes left. How many boxes were sold during the week?<br><div style="text-align: center;">Subtract<br/>39 boxes</div> | 8. Jean played 9 holes of golf. She took the same number of shots for each hole. If she took a total of 36 shots, how many shots did she take for each hole?<br><div style="text-align: center;">Divide<br/>4 shots</div> |

## Reteaching 88

Name \_\_\_\_\_ R88

Kelley worked 4 days. She made 3 puppets each day. How many puppets did she make in all?  
 $4 \times 3 = 12$   
Kelley made 12 puppets in all.

Circle the correct operation. Then find the answer.

|   |  |
|---|--|
| 1. It took 7 hours to build the stage. Robert worked 5 hours one day. How many hours were left over?<br><div style="text-align: center;">Addition   Subtraction<br/>2 hours</div> | 2. William sold 8 tickets. Kara sold 12 tickets. Micki sold 9 tickets. How many tickets did they sell in all?<br><div style="text-align: center;">Addition   Multiplication<br/>29 tickets</div>           |
| 3. There were 45 seats. They were in 9 equal rows. How many seats were in each row?<br><div style="text-align: center;">Multiplication   Division<br/>5 seats</div>               | 4. There were 3 puppet shows. 30 people came to each show. What was the total number of people who saw the puppet shows?<br><div style="text-align: center;">Addition   Multiplication<br/>90 people</div> |
| 5. The students made 150 programs. They used 110 programs. How many programs were left over?<br><div style="text-align: center;">Addition   Subtraction<br/>40 programs</div>     |  |



**Try** Tell whether you *add, subtract, multiply, or divide*. Then find the answer. Use place-value materials when you need them.

- a. Philip bought 5 sets of coins with 6 coins in each set. What was the total number of coins?  
**Multiply. 30 coins**

- b. The odometer on the Andrewses' car showed 4,965 before they left. Now it shows 8,213. How many miles did they travel?  
**Subtract. 3,248 mi.**

**Apply** Tell whether you *add, subtract, multiply, or divide*. Then find the answer. Use place-value materials when you need them.

- The Andrewses spent 28 days on vacation. How many 7-day weeks was that?  
**Divide. 4 weeks**
- Jenny displayed 36 flags in rows with 5 flags in each row. How many rows were filled? How many flags were left over?  
**Divide. 7 rows, 1 flag left over**
- William bought 6 travel booklets. Each booklet had 18 pages. How many pages were there in all?  
**Multiply. 108 pages**
- The Andrewses spent \$48.72 for gas the first week, \$37.95 the second week, \$57.03 the third week, and \$51.18 the fourth week. What was the total cost of the gas?  
**Add. \$194.88**
- Mr. Andrews brought 25 flower bulbs home. He planted an equal number of bulbs in each of 4 pots. How many bulbs did he plant in each pot? How many bulbs were left over?  
**Divide. 6 bulbs, 1 bulb left over**

- Jenny has collected 36 state flags. How many more of the 50 state flags does she need?  
**Subtract. 14 more flags**
- Philip counted 49 Texas license plates. Jenny counted 7 more Texas plates than Philip. How many Texas plates did she count?  
**Add. 56 plates**
- William bought 32 drawings. The drawings came in sets of 4. How many sets did William buy?  
**Divide. 8 sets**
- The family used 8 rolls of film with 24 pictures on each roll. How many pictures did the family take?  
**Multiply. 192 pictures**
- Mr. Andrews drove the car 15 hours during the vacation. Mrs. Andrews drove the car 3 times as many hours as her husband. How many hours did they drive in all?  
**Multiply and add. 60 hours**
- Calculator** The Andrews family also brought 72 oranges home. How many dozen oranges did they bring home?  
**6 dozen**

More Practice Set 88, page 383 237

## Assignment Guide

basic 1-7, 11  
average 1-9, 11  
enriched 1-11

**More Practice Set 88,  
page 383**

## Follow-Up

### Extra Practice Additional problems

Have the students tell the operation needed for each of these problems and then solve.

- The Smiths spent 12 days in Utah and Arizona. They spent 3 days in Arizona. How many days did they spend in Utah? [Subtraction; 9]
- The Smiths drove 12 hours on Monday. Each driver drove for 3 hours. How many drivers were there? [Division; 4]
- Chris bought 3 pictures for \$12.00 each. What was the total cost? [Multiplication; \$36.00]
- Lee had 12 decals. He bought 3 more. How many decals does Lee have now? [Addition; 15]

### Reteaching Using Concrete Materials

Let students use objects or draw pictures to help solve the problems.

**Enrichment Write a problem** Have students make up problems similar to those in *Extra Practice*, using the same numbers with each of the four operations. Then have them exchange papers and solve each problem.

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic, and then give reasons for their choices.

- $48 \div 8$  [6]
- $59 \times 4$  [236]
- $89 + 23 + 11 + 77$  [200]
- $3,120 - 897$  [2,223]
- $135 \times 86$  [11,610]
- $500 - 96$  [404]

### Cooperative Learning Groups

See page 481 of this Teacher's Edition.

## Daily Maintenance

Round to the nearest hundred.

- 123 [100]
- 4,354 [4,400]
- 435 [400]
- 2,572 [2,600]
- 493 [500]
- 3,916 [3,900]

## Enrichment 88

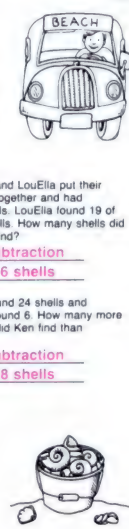
Name \_\_\_\_\_ E88

**Field Trip**

Mr. Thornton's class took a field trip to the beach to look for shells.

Name the operation. Then give the answer.

- Cindy found 7 shells. Tom found 6 times that many. How many shells did Tom find?  
**Multiplication**  
42 shells
- Bill found as many shells as Juan and Ann together. Ann found 21 shells and Juan found 7 shells. How many shells did Bill find?  
**Addition**  
28 shells
- Kathy and LouElla put their shells together and had 35 shells. LouElla found 19 of the shells. How many shells did Kathy find?  
**Subtraction**  
16 shells
- Lisa, Diane, and Andy each found 9 shells. Altogether, how many shells did they find?  
**Multiplication**  
27 shells
- Ken found 24 shells and Kieth found 6. How many more shells did Ken find than Kieth?  
**Subtraction**  
18 shells
- George, Mary, Jon, Sue, Carl, and Maria all put their shells together in a bucket. When they were done, they shared them equally. Altogether, they found 54 shells. How many shells did each one get?  
**Division**  
9 shells



## Additional Resource 88

Name \_\_\_\_\_ Additional Resource 88

**Mental Math One Step at a Time**

You can do these division exercises in your head if you work one step at a time.

Divide mentally.

- $45 \div 5 = 9$
- $72 \div 9 = 8$
- $42 \div 7 = 6$
- $50 \div 5 = 10$
- $16 \div 2 = 8$
- $48 \div 4 = 12$
- $63 \div 7 = 9$
- $27 \div 3 = 9$
- $81 \div 9 = 9$
- $40 \div 4 = 10$
- $36 \div 4 = 9$
- $18 \div 2 = 9$
- $16 \div 2 = 8$
- $40 \div 5 = 8$
- $32 \div 4 = 8$
- $72 \div 9 = 8$
- $72 \div 8 = 9$
- $60 \div 10 = 6$



## Chapter 8 Test

An acceptable score for each objective is suggested on the Chapter 8 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

| Objective | Test items   | Text pages |
|-----------|--------------|------------|
| 78        | 1, 2         | 212-213    |
| 79        | 3, 4, 13, 14 | 214-215    |
| 80        | 5, 6, 15, 16 | 216-217    |
| 81        | 7, 8, 17, 18 | 218-219    |
| 82        | 9, 19        | 222-223    |
| 83        | 10, 20       | 224-225    |
| 84        | 11, 21       | 226-227    |
| 85        | 12, 22, 23   | 228-229    |
| 86        | 27, 28       | 230-231    |
| 87        | 24-26        | 234-235    |
| 88        | 29, 30       | 236-237    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 30             | 100 | 22             | 73 |
| 29             | 97  | 21             | 70 |
| 28             | 93  | 20             | 67 |
| 27             | 90  | 19             | 63 |
| 26             | 87  | 18             | 60 |
| 25             | 83  | 17             | 57 |
| 24             | 80  | 16             | 53 |
| 23             | 77  | 15             | 50 |

### Additional Ideas for Evaluation

See pages 464-467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 8 Form for Individualizing
- Cumulative Record Folder

## Chapter 8 Test

Complete each division sentence.

1. 12 in all  
How many groups of 3?



$$12 \div 3 = 4$$

2. 16 in all  
8 equal groups  
How many in each group?



$$16 \div 8 = 2$$

Divide.

- |                       |                        |
|-----------------------|------------------------|
| 3. $2 \overline{)18}$ | 4. $3 \overline{)15}$  |
| 5. $4 \overline{)8}$  | 6. $5 \overline{)20}$  |
| 7. $3 \overline{)0}$  | 8. $1 \overline{)6}$   |
| 9. $6 \overline{)48}$ | 10. $7 \overline{)49}$ |
| 11. $8 \overline{)8}$ | 12. $9 \overline{)27}$ |
| 13. $6 \div 2$        | 14. $21 \div 3$        |
| 15. $16 \div 4$       | 16. $5 \div 5$         |
| 17. $0 \div 9$        | 18. $2 \div 1$         |
| 19. $36 \div 6$       | 20. $56 \div 7$        |
| 21. $72 \div 8$       | 22. $45 \div 9$        |

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Write a family of facts using the given numbers.

23. 5, 6, 30  
 $5 \times 6 = 30$   $30 \div 5 = 6$   
 $6 \times 5 = 30$   $30 \div 6 = 5$

Divide.

24.  $9 \overline{)70}$       25.  $5 \overline{)27}$       26.  $4 \overline{)31}$

Solve each problem.

27. Leslie had 17 pennies. She gave 5 pennies to her brother and 4 more to her sister. How many pennies did Leslie have left?  
**8 pennies**
28. 11 children were playing. 3 children left. The remaining children made 2 equal teams. How many children were on each team?  
**4 children**

Tell whether you *add*, *subtract*, *multiply*, or *divide*. Then find the answer.

29. Perry made a pattern with marbles. He put 4 marbles in each of 12 rows. How many marbles did he use in all?  
**Multiply. 48 marbles**
30. A florist had 48 flowers. He put 6 flowers in each vase. How many vases did he use?  
**Divide. 8 vases**

## Chapter 8 Letter Home

**Keeping You Posted**

In mathematics, we have been studying division facts through  $81 \div 9$ . You may wish to use flashboards to help your child memorize these division facts. Next, we will study division exercises such as  $315 \div 2$  and  $69 \div 22$ .

To: Family

Work each exercise. Shade the letters with the answers: 1, 2, 3, 4, 5, and 6. Then read the message.

YOU CAN  
 BIDON GOOD  
 AMATHOME  
 HOWORKEY

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## Chapter 8 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

Complete each division sentence.

1. 18 in all  
How many groups of 6?  
 $18 \div 6 = 3$

2. 14 in all  
7 equal groups.  
How many in each group?  
 $14 \div 7 = 2$

Divide:

|                        |                        |
|------------------------|------------------------|
| 3. $2 \overline{)12}$  | 4. $3 \overline{)27}$  |
| 5. $4 \overline{)24}$  | 6. $5 \overline{)25}$  |
| 7. $1 \overline{)8}$   | 8. $6 \overline{)10}$  |
| 9. $6 \overline{)42}$  | 10. $7 \overline{)63}$ |
| 11. $8 \overline{)24}$ | 12. $9 \overline{)54}$ |
| 13. $10 \div 2$        | 14. $27 \div 9$        |
| 15. $28 \div 4$        | 16. $30 \div 5$        |
| 17. $0 \div 7$         | 18. $4 \div 1$         |
| 19. $12 \div 6$        | 20. $7 \div 7$         |
| 21. $48 \div 8$        | 22. $18 \div 9$        |

### Posttest Chapter 8

1. **3 groups**
2. **2 in each group**
3. **6**
4. **9**
5. **6**
6. **5**
7. **8**
8. **0**
9. **7**
10. **9**
11. **3**
12. **6**
13. **5**
14. **3**
15. **7**
16. **6**
17. **0**
18. **4**
19. **2**
20. **1**
21. **6**
22. **2**

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Name \_\_\_\_\_

Write a family of facts using the given numbers.

23. 7, 5, 35  
 $7 \times 5 = 35$   
 $5 \times 7 = 35$   
 $35 \div 7 = 5$   
 $35 \div 5 = 7$

Divide:

24.  $6 \overline{)40}$       25.  $5 \overline{)19}$       26.  $4 \overline{)35}$

Solve each problem:

27. Andrea had 19 pennies. She gave 7 pennies to her sister and 6 more to her brother. How many pennies did Andrea have left?  
**6 pennies**

28. 13 children were playing. 7 children left. The remaining children made 2 equal teams. How many children were on each team?  
**3 children**

Tell whether you *add*, *subtract*, *multiply*, or *divide*. Then find the answer.

29. Stephen made a pattern with marbles. He put 6 marbles in each of 12 rows. How many marbles did he use in all?  
**Multiply 72 marbles**

30. A florist had 45 flowers. He put 5 flowers in each vase. How many vases did he use?  
**Divide 9 vases**

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# CHALLENGE

## Missing Factors

- a. The 18-foot Saguaro Cactus is 3 times as tall as the 6-foot Organ-Pipe Cactus.

$$3 \times 6 = 18$$

Factor      Factor      Product

- b. The 18-foot Saguaro Cactus is how many times as tall as the 2-foot Barrel Cactus?

$$\square \times 2 = 18$$

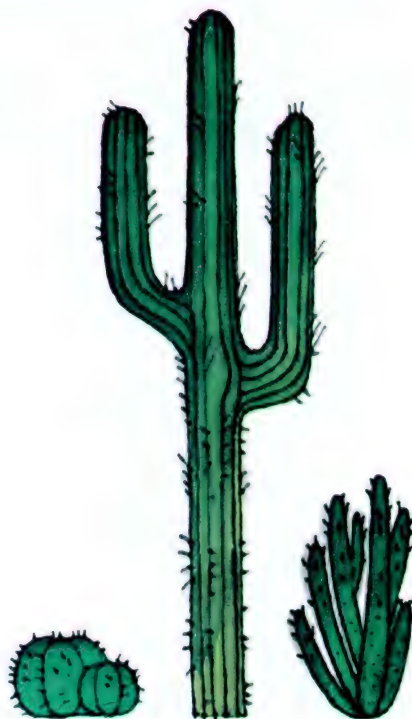
Factor      Factor      Product

To find the missing factor, divide the product by the given factor.

$$18 \div 2 = 9$$

9 is the missing factor.

The Saguaro Cactus is 9 times as tall as the Barrel Cactus.



## Challenge

### Materials

- Tens, Units (Punchouts or Math Kit)

**Using Concrete Materials** Write the equation  $3 \times n = 18$  on the chalkboard. Give each student 18 counters and ask if they know how many groups they should form. [3] Have them arrange the counters into 3 equal groups. Then they can count the number of counters in each group to find the missing factor. [6] Repeat this activity with other missing-factor equations.

Be sure students understand that the phrase "times as tall" indicates a need to multiply in Example A. In Example B, students will notice that the factor needed to multiply is missing. They will need to divide to find the missing factor. You might wish to have students give the division sentence they must use to find the missing factor.

Find each missing factor.

- |                                  |                                  |                                  |                                  |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| 1. $4 \times \square = 24$<br>6  | 2. $\square \times 6 = 36$<br>6  | 3. $3 \times \square = 21$<br>7  | 4. $\square \times 2 = 14$<br>7  |
| 5. $\square \times 5 = 30$<br>6  | 6. $8 \times \square = 16$<br>2  | 7. $\square \times 7 = 28$<br>4  | 8. $5 \times \square = 20$<br>4  |
| 9. $8 \times \square = 64$<br>8  | 10. $\square \times 6 = 42$<br>7 | 11. $9 \times \square = 45$<br>5 | 12. $\square \times 7 = 49$<br>7 |
| 13. $\square \times 7 = 63$<br>9 | 14. $8 \times \square = 72$<br>9 | 15. $\square \times 6 = 30$<br>5 | 16. $4 \times \square = 36$<br>9 |
| 17. $3 \times \square = 24$<br>8 | 18. $\square \times 9 = 0$<br>0  | 19. $7 \times \square = 7$<br>1  | 20. $\square \times 9 = 36$<br>4 |

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### Answers, page 229

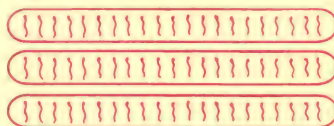
- |  |  |
|--|--|
| 38. $2 \times 7 = 14$<br>$7 \times 2 = 14$<br>$14 \div 2 = 7$<br>$14 \div 7 = 2$ | 39. $4 \times 4 = 16$<br>$16 \div 4 = 4$   |
| 40. $5 \times 6 = 30$<br>$6 \times 5 = 30$<br>$30 \div 5 = 6$<br>$30 \div 6 = 5$ | 41. $3 \times 8 = 24$<br>$8 \times 3 = 24$<br>$24 \div 3 = 8$<br>$24 \div 8 = 3$ |
| 42. $5 \times 9 = 45$<br>$9 \times 5 = 45$<br>$45 \div 5 = 9$<br>$45 \div 9 = 5$ | 43. $8 \times 8 = 64$<br>$64 \div 8 = 8$   |
| 44. $7 \times 8 = 56$<br>$8 \times 7 = 56$<br>$56 \div 7 = 8$<br>$56 \div 8 = 7$ | 45. $2 \times 3 = 6$<br>$3 \times 2 = 6$<br>$6 \div 2 = 3$<br>$6 \div 3 = 2$     |
| 46. $1 \times 4 = 4$<br>$4 \times 1 = 4$<br>$4 \div 1 = 4$<br>$4 \div 4 = 1$     | 47. $0 \times 9 = 0$<br>$9 \times 0 = 0$<br>$0 \div 9 = 0$                       |

### Answers, page 213

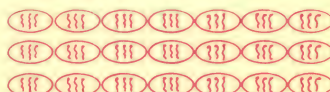
A sample is given for Exercises 1 and 4.



10. 3 groups of 21 worms



11. 21 groups of 3 worms



Each of the fishermen would still get 21 worms. Each would get 7 groups of 3 worms.

12. 12 groups of 3



13. 4 pieces of chalk in each group  
9 equal groups





## Using Problem-Solving Strategies

- List all possibilities.

### Introduction

In order to solve this problem, students will need to use the clues to determine what amounts of money could not be in the sugar bowl. To interpret the clues, students will need to know the value of a nickel, a dime, and a dollar, multiplication facts, and division facts.

### Using the Page

Use the information given in the clues and *list all possibilities* of money amounts. The first clue tells that there is more than 35 cents in the bowl. The second clue tells that there is less than \$1. We now have the list of possible amounts of money: 36, 37, 38, . . . 98, 99.

The third clue tells that the amount is divisible by 6. By eliminating numbers not divisible by 6, the list becomes shorter: 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, and 96.

The next clue tells that the amount is not divisible by 7. So numbers divisible by 7 are eliminated. The list is now: 36, 48, 54, 60, 66, 72, 78, 90, and 96.

Since the money could be traded for dimes with nothing left over, the amount must be a multiple of 10. There are now two possibilities left: 60 and 90.

The last clue tells that 90 is not correct. All possibilities but one, [60] have been eliminated.

Use a similar procedure to solve Problems 2 and 3.

## Using Problem-Solving Strategies

# GRANDMA'S SUGAR BOWL

Guess how much money I have in my sugar bowl.

There are 7 nickels, but that's not all.

There is less than a dollar.

I can separate it into 6 piles with the same amount in each pile.

I cannot make 7 piles with the same amount in each pile.

I could trade my money for dimes and have nothing left over.

If I had one more dime, I could then separate the money into 7 piles with the same amount in each pile.

1. How much money do I have in my sugar bowl? **60¢**

My cream pitcher has less than a dollar in it including 6 dimes. I could make 3 equal piles of money but could not make 4, 5, or 6 equal piles.

2. What is the smallest amount of money that could be in the pitcher? **63¢**

3. What is the greatest amount of money that could be in the pitcher? **99¢**



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance: Choosing a Computation Method, p. 405



## Mathematical Background

**More Division Concepts** Suppose 195 marbles are to be put into containers that hold 6 marbles each. How many containers are needed? Like the ones in the previous chapter, this problem involves division. Because  $32 \times 6 = 192$ , there must be 32 containers, each holding 6 marbles, and 3 marbles left over.

**The Division Algorithm** Because most people do not know which multiple of 6 is closest to 195, we use a division algorithm. In order to find the first digit of the quotient, we estimate based on multiples of 10. Because 30 times 6 is 180 and 40 times 6 is 240, the quotient is greater than 30 and less than 40. Thus the first digit of the quotient must be 3. The 3 is written above the 9 because the 9 is in the tens place.

$$\begin{array}{r} 30 \\ 6 \overline{)195} \\ \underline{18} \phantom{0} \\ 15 \phantom{0} \end{array}$$

The exercises on the right show what really is happening as you work through the division algorithm.

$$\begin{array}{r} 32 \\ 6 \overline{)195} \\ \underline{18} \phantom{0} \\ 15 \phantom{0} \\ \underline{12} \phantom{0} \\ 3 \phantom{0} \end{array}$$

$$30 + 2 = 32$$

$$\begin{array}{r} 32 \text{ R}3 \\ 6 \overline{)195} \\ \underline{18} \phantom{0} \\ 15 \phantom{0} \\ \underline{12} \phantom{0} \\ 3 \phantom{0} \end{array}$$

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## Pretest for Chapter 9

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

| Name _____  |                        | Pretest Chapter 9      |  |
|---|------------------------|------------------------|--|
| Divide.   |                        |                        |  |
| 1. $4 \overline{)68}$   | 2. $7 \overline{)83}$  | 1. <u>17</u>           |  |
|   |                        | 2. <u>11 R6</u>        |  |
| 3. $6 \overline{)62}$   | 4. $3 \overline{)61}$  | 3. <u>10 R2</u>        |  |
|   |                        | 4. <u>20 R1</u>        |  |
| 5. $5 \overline{)573}$  | 6. $4 \overline{)984}$ | 5. <u>114 R3</u>       |  |
|   |                        | 6. <u>246</u>          |  |
| 7. $6 \overline{)36}$   | 8. $2 \overline{)801}$ | 7. <u>106</u>          |  |
|   |                        | 8. <u>400 R1</u>       |  |
| 9. $8 \overline{)352}$  | 10. $6 \overline{)56}$ | 9. <u>44</u>           |  |
|   |                        | 10. <u>9 R2</u>        |  |
| 11. $\$4.80 \div 3$   | 12. $\$0.60 \div 5$    | 11. <u>\\$1.60</u>     |  |
|   |                        | 12. <u>\\$0.12</u>     |  |
| Solve each problem.   |                        |                        |  |
| 13. Liza needs 53 beads to make a necklace. The beads come in packages of 4. How many packages should Liza buy? |                        | 13. <u>14 packages</u> |  |
| 14. A 6-inch piece of ribbon is needed to make a bow. How many bows can be made from 160 inches of ribbon?      |                        | 14. <u>26 bows</u>     |  |

| Name _____  |                          | Pretest Chapter 9<br><small>continued</small>  |  |
|---|--------------------------|--|--|
| Find the average of each group of numbers.  |                          |  |  |
| 15. 4 8 3   |                          | 15. <u>5</u>   |  |
| 16. 32 43 27 24 34  |                          | 16. <u>32</u>  |  |
| Divide.   |                          |  |  |
| 17. $20 \overline{)120}$  | 18. $30 \overline{)246}$ | 17. <u>6</u>   |  |
|   |                          | 18. <u>8 R6</u>  |  |
| 19. $23 \overline{)69}$   | 20. $34 \overline{)105}$ | 19. <u>3</u>   |  |
|   |                          | 20. <u>3 R3</u>  |  |
| 21. $37 \overline{)73}$   | 22. $64 \overline{)547}$ | 21. <u>1 R36</u>   |  |
|   |                          | 22. <u>8 R35</u>   |  |
| 23. $52 \overline{)24}$   | 24. $26 \overline{)28}$  | 23. <u>12</u>  |  |
|   |                          | 24. <u>27 R24</u>  |  |
| Write an equation. Then find the answer.  |                          |  |  |
| 25. A jack rabbit can run 40 miles per hour. At this rate, how far could the rabbit run in 3 hours? |                          | 25. <u><math>40 \times 3 = n</math></u><br><u><math>n = 120</math></u><br><u>120 miles</u>       |  |
| 26. A bus traveled 172 miles in 4 hours. What was its average speed in miles per hour?              |                          | 26. <u><math>172 \div 4 = n</math></u><br><u><math>n = 43</math></u><br><u>43 miles per hour</u> |  |



## Teaching Chapter 9



### Problem Solving

**Five-Step Method** It is important that students understand that answering a problem involves more than just performing the required computation. Students must read the problem carefully and decide what makes sense as an answer. This is especially true with division; 3 R1 rarely makes sense in an answer to a word problem. The problem-solving lesson on pages 256–257 focuses on the ANSWER step and introduces students to *Interpreting Remainders*. In this lesson students must decide whether the answer to the problem is the whole-number part of the quotient, a number one greater than the whole number part of the quotient, or the remainder.

If students are having difficulty, encourage them to draw a picture for each problem. For the problems that involve more difficult computation, it is a good idea to allow students to substitute simpler numbers before they draw a picture. Once students understand what they are doing, they can go back to the original numbers in the problem.

**Problem-Solving Strategies** The nonroutine problems in the *Using Problem-Solving Strategies* feature on pages 268–269, 274, 426, and 427, and on **Math Poster KK** give students more opportunities to choose and then use strategies such as *Find a pattern*, *Draw a picture*, *Make a table*, *Try and check*, *List all possibilities*, *Use physical models*, and *Solve a simpler problem*.



### Estimation and Mental Math

**Estimation** It is a good idea to encourage students to estimate quotients when they compute. It is especially important when zeros appear in the quotient. In this chapter students use *compatible numbers* to estimate quotients and the number of digits in the quotient.

To estimate  $62 \div 6$ , students can use their knowledge of multiples of ten and give 10 as the estimated quotient ( $60 \div 6 = 10$ ). As the numbers in the divisor and dividend get larger, students will need to first estimate the number of digits in the quotient, and then use their knowledge of basic facts to estimate quotients.

$$\begin{array}{r} 3 \overline{)228} \end{array}$$

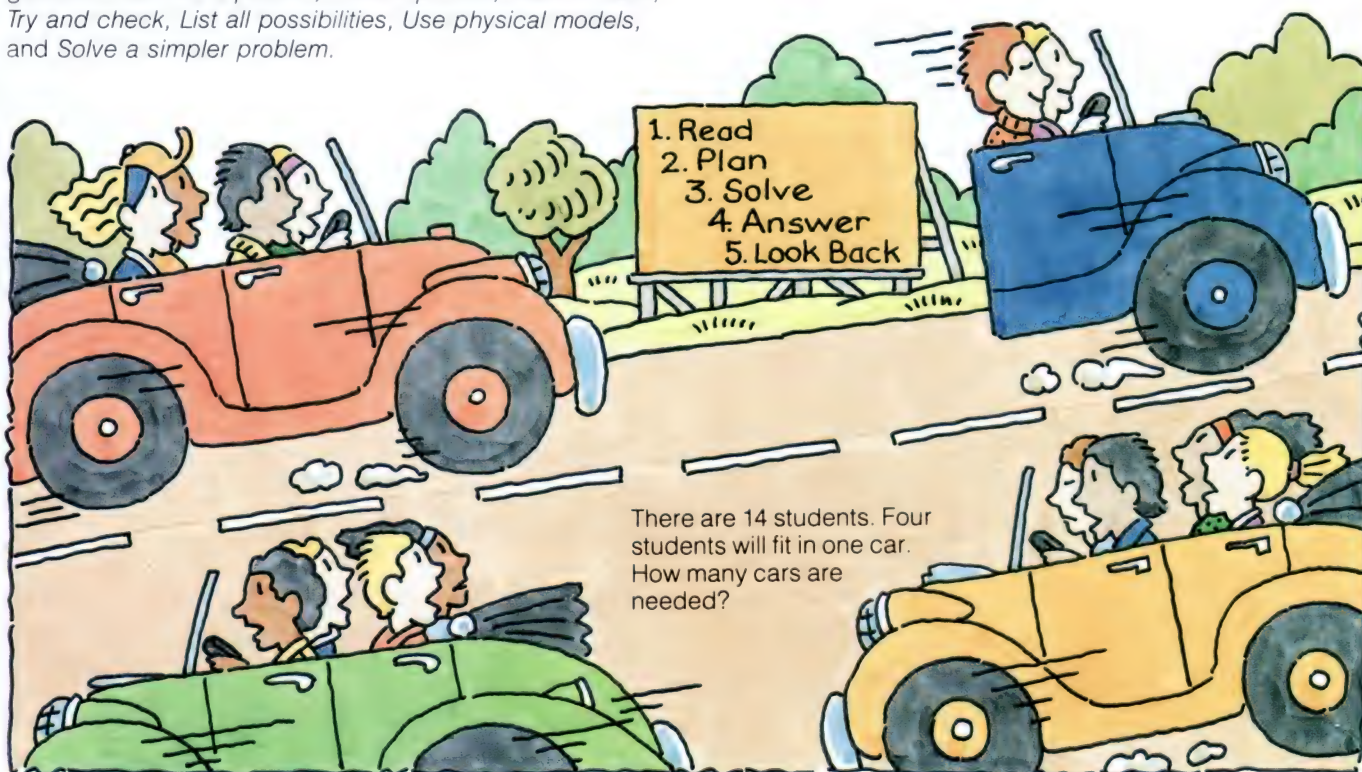
Since 3 does not divide 2 but does divide 22, the quotient is in the tens.

$$\begin{array}{r} ? \phantom{0} \\ 3 \overline{)22} \end{array}$$

Since 3 does not divide 22 evenly, find the closest number that 3 divides evenly. In this case, it is 21.

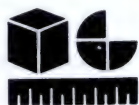
$$\begin{array}{r} 70 \\ 3 \overline{)210} \end{array}$$

The quotient is about 70.



Each problem-solving lesson in the text shows the five-step method. In every lesson, one step is highlighted and emphasized.





## Concrete Materials

In this chapter, students use concrete materials to learn long division. In some lessons, they work completely with concrete materials, and then, in a later lesson, learn to divide using the algorithm. Throughout the chapter, students compare their work with concrete materials to the steps of the algorithm.

To illustrate long division, use story problems similar to the following example, rather than ordinary exercises. Larry has 75 balloons. He wants to put an equal number of balloons in each of the 4 corners of the room. How many balloons will he put in each corner?

In the example, 4 represents the number of groups. Have students display 75 counters, and estimate how many of the 75 can be put into each of the 4 groups. As students become familiar with the process, they should see that there will be at least 10 counters in each group. Have them remove 10 counters to place in each of 4 groups, or 40 in all;  $75 - 40 = 35$ . Then tell students to determine how many of the 35 counters left can be divided into the 4 groups. Students should put 8 counters in each group and have 3 remaining.



## Calculators and Computers

**Calculators** In this chapter, calculators are used to help build the concepts of long division. On page 245, students use a calculator to divide, and then they relate the decimal part of the quotient to the remainder. On page 249, students divide with a calculator to find missing numbers. You may want to suggest that students construct a table to help solve these problems. In **Additional Resource 91**, students again divide with a calculator, this time to find missing factors in multiplication sentences. On page 257 and in **Additional Resource 98**, students use a calculator to do divisions involving money.

**Computers** This chapter discusses the INPUT statement, which introduces data into a program. The use of a variable in the INPUT statement is introduced as a letter name for a memory location.

You might want to demonstrate this concept by having students repeatedly “act out” the lines in the program. Each time the INPUT *N* line comes up, the child assigned to that line can collect a different number for the following lines to operate on. You can point out that the only difference in successive runs of the program is the number being operated on. **Additional Resource 92** provides further practice with INPUT statements. **Additional Resource 99** introduces the idea of multiple inputs in one statement.



## Teaching Techniques

**Questioning and Responding** For some of the word problems in this chapter, conduct a class discussion as to which operation to choose before students individually do the computation. You might ask one student which operation is correct, and then have the others signal agreement (thumbs up), disagreement (thumbs down), or “not sure” (thumbs to the side). Then have students explain why they agree or disagree. With this technique, you’ll know whether students understand how to choose the operation or whether they are just guessing.

**Helping Students Read and Write Mathematics** When students read examples of division computation in this chapter, remind them that sometimes the important digits in an example are highlighted with color. When students write division exercises on paper, remind them to line up digits carefully. Writing on lined paper (turned sideways) or on graph paper may help some students.

**Teaching Students with Special Needs** Gifted students are usually good at making generalizations. After your students have completed **Enrichment 90**, you might pose these questions: If you have 2 as the divisor, what cards would you put in the ones place to have no remainder? If 3 is the divisor, what cards can you use to get a remainder of 1? If the divisor is 4, and you want no remainder, what cards would you use in the ones place?

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

**Reading:** Paul Bunyan (246–247, 248–249)

**Science:** speeds of animals (270–271)



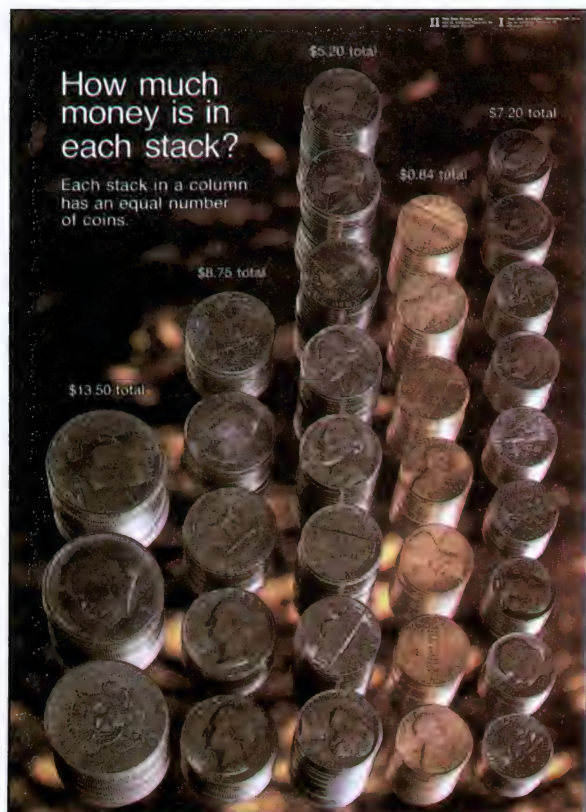
## Thinking Skills

In this chapter, students follow rules and procedures for division computation. Activities with concrete materials are suggested to make sure students **comprehend concepts** needed to understand why the procedure works. Students **apply concepts** as they *write equations* for problems. The *Using Problem-Solving Strategies* features and the lesson on interpreting remainders involve students in **analyzing relationships**. The Thinking Skills exercise on page 251 and the problem on page 427 involve students in *finding patterns* to make generalizations.

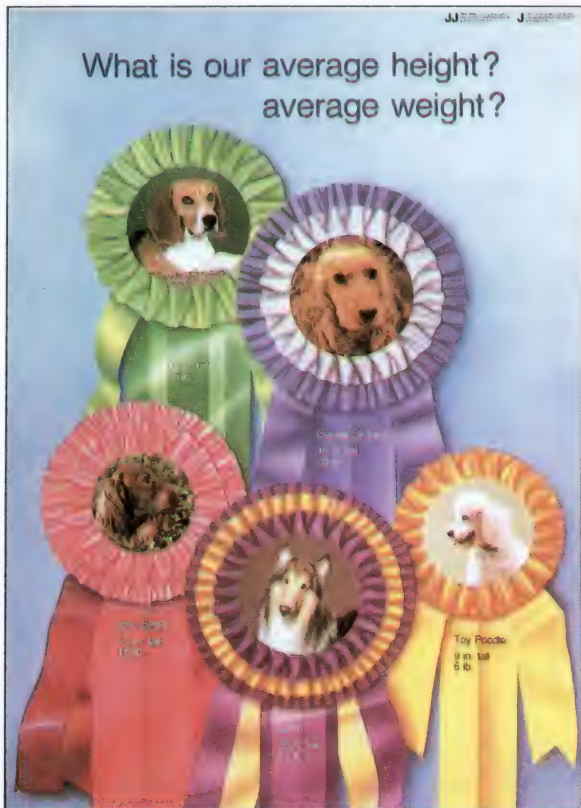


## Bulletin Board Suggestions

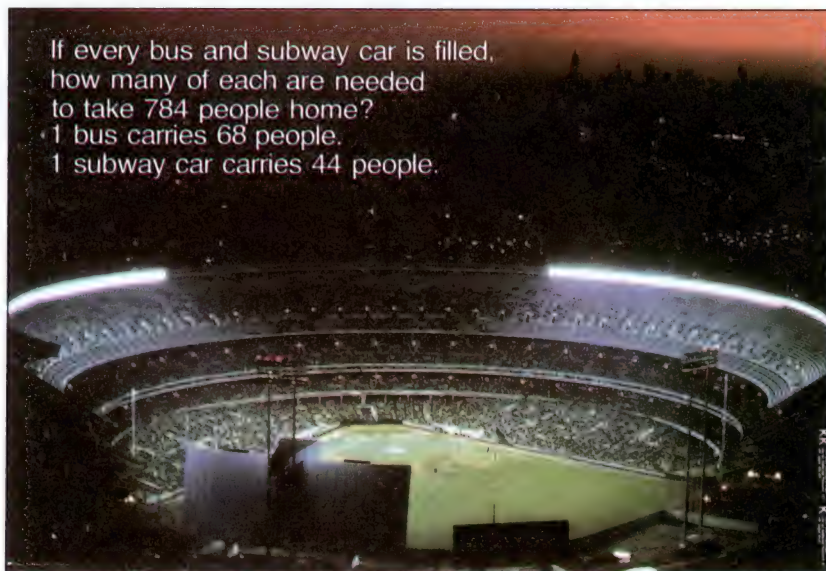
The posters shown here can be used with Chapter 9. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster II



Math Poster JJ



Math Poster KK

## Materials Chapter 9

- Hundreds, tens, units (Punchouts or Math Kit) 242–249, 258–261
- Book about Paul Bunyan 246–247
- Inch rulers (Teaching Aid F, Punchouts, or Math Kit) 248–249
- Centimeter grid (Teaching Aid K) 250–251
- Money (Punchouts) 252–253, 258–259
- Markers 254–255
- Spinner 254–255
- Game board 254–255
- Calculator 254–257, 266–267, 271–272
- Common objects 256–257
- Egg carton 258–259
- Beans 258–259
- Basketball 268–269



**Basic Situation**

Use the picture on this page to generate a discussion about the amount of milk Paul Bunyan would drink in one day. The amount shown would not even wet his whistle. How could a diet for Paul (who is depicted in the lessons on pages 246–249) be planned?

**Possible Problems**

- What are the food groups that should be included in a person's daily diet?
- How large was Paul Bunyan?
- What is the average amount of milk that students in the class drink? How many times this amount did Paul drink?
- How much would Paul Bunyan's breakfast cost in this area of the country?
- What would be a good dinner menu for Paul Bunyan? What would be the approximate cost?

**Indicators of Success**

Students might use the information found on page 246, Problems 25 and 26 on page 247, and Problems 28 and 29 on page 249 to help them decide how large Paul Bunyan was.

Students will need to consult their parents or go to the grocery store to determine the costs of foods that they include in Paul's diet.

Students might wish to display a dinner menu on the bulletin board.

**Ways to Help**

Encourage students to use information about Paul that could be compared with corresponding information about themselves to determine how large Paul was. For example, they might compare the length of Paul's shoe given in Problem 29 on page 249 with the length of their own shoe. Ask them to find how many times as large as their shoe Paul's shoe is.

Encourage students to use estimation techniques since their findings will be approximate in any case.

Some students may want to use a calculator for calculations with large numbers.

$$\begin{array}{r} 10 \text{ R}2 \\ 3 \overline{)32} \end{array}$$



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

**Background Information**

Paul Bunyan was a legendary hero in American lumber camps in Michigan, Minnesota, and Wisconsin. Paul's blue ox, Babe, had horns that were over 42 ax handles wide. Babe could pull a crooked logging road straight and could drink a river dry.

Paul's toothpicks were 4-foot logs. He made hotcakes on a griddle seven blocks long, heated by a two-acre brush fire and greased by lumberjacks skating over its surface on slabs of bacon strapped to their feet.

A daily diet should include:

1. vegetables and fruits
2. breads and cereals
3. milk and cheeses
4. meat, poultry, fish, eggs, and beans, and nuts.

A sample dinner for Paul Bunyan might be:

- 200 lb. steak
- 300 baked potatoes
- 250 cups of green beans
- 15 loaves of bread
- 50 baked apples
- 175 quarts of milk



**Objective 89** (Target Objective)  
Divide a two-digit number by a one-digit number to get a two-digit quotient.

**Lesson Theme**  
Recreation: Collecting Shells

**Materials**  
• Tens, Units (Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Ask students to divide using counters.

- $63 \div 9$  [7]
- $16 \div 3$  [5 R1]
- $27 \div 8$  [3 R3]

## Using the Pages

**Teach** *Using Concrete Materials*

Working through Example A, students should see that each of the four children would first receive 2 tens. The remaining ten would be renamed as 10 ones and added to the 4 ones remaining in the dividend. Then they would divide 14 among the children, leaving each with a total of 23 shells, with 2 shells left over. In Example B, ask students to think of a corresponding multiplication sentence:  
2 times what number is 80?

**Practice** For Exercise 17, after students have worked in groups, guide the class through each step of the algorithm with place-value materials. Emphasize the importance of comparing the difference found at the end of each step with the divisor. If it is greater than the divisor, then the number tried in the quotient is too small.

**Apply** *Problem Solving*

**Multiple-step** In Problem 30, the numbers in the first sentence are extra information. The students need to add and then divide to solve the problem.

## One-Digit Divisors, Two-Digit Quotients

**See Using the Pages for a discussion of these examples.**

- A.** The Randalls collected 94 shells while on vacation. The shells were divided equally among their 4 children. How many shells did each child get? How many shells were left over?

Find  $94 \div 4$ .

Work in groups of four. Use your place-value materials to show 9 tens and 4 ones.

Now pretend that each of you is one of the 4 Randall children and that your place-value materials are shells and groups of shells. Divide the 94 shells equally among the 4 of you. Do you have to exchange the 9 tens for 90 ones? How many tens do each of you have? What can you do with any of the tens that are left over?

How many shells did each of the Randall children get? How many shells were left over?

**23 shells; 2 shells left over**

- B.** Find  $80 \div 2$ . **40**

Discuss in your group how to find this quotient mentally. Then give the quotient.

**Try** Work in groups. Use your place-value materials to divide.

- a.  $4 \overline{) 63}$  **15 R3**      b.  $2 \overline{) 98}$  **49**      c.  $82 \div 7$  **11 R5**  
d. Find  $60 \div 3$  mentally. **20**

**Practice** Use your place-value materials to divide.

1.  $5 \overline{) 86}$  **17 R1**      2.  $3 \overline{) 96}$  **32**      3.  $6 \overline{) 77}$  **12 R5**  
4.  $2 \overline{) 51}$  **25 R1**      5.  $4 \overline{) 87}$  **21 R3**      6.  $9 \overline{) 99}$  **11**  
7.  $35 \div 2$       8.  $46 \div 3$  **15 R1**  
9.  $61 \div 5$  **12 R1**      10.  $88 \div 2$  **44**

**Mental math** Divide mentally. Write only the quotient.

11.  $4 \overline{) 80}$  **20**      12.  $3 \overline{) 90}$  **30**      13.  $5 \overline{) 50}$  **10**  
14.  $2 \overline{) 60}$  **30**      15.  $6 \overline{) 60}$  **10**      16.  $2 \overline{) 40}$  **20**



## Practice 89

Name \_\_\_\_\_

Check each division. If the answer is wrong, give the correct answer. If the answer is correct, write yes.

|                                     |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. $16 \overline{) 81}$ <b>5 R1</b> | 2. $33 \overline{) 82}$ <b>2 R2</b> | 3. $10 \overline{) 89}$ <b>8 R9</b> | 4. $37 \overline{) 81}$ <b>2 R1</b> |
| <b>Yes</b>                          | <b>Yes</b>                          | <b>12 R2</b>                        | <b>Yes</b>                          |

Divide.

|                                     |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 5. $4 \overline{) 15}$ <b>3 R3</b>  | 6. $3 \overline{) 14}$ <b>4 R2</b>  | 7. $4 \overline{) 16}$ <b>4</b>     | 8. $3 \overline{) 15}$ <b>5 R0</b>  |
| 9. $4 \overline{) 17}$ <b>4 R1</b>  | 10. $6 \overline{) 18}$ <b>3</b>    | 11. $5 \overline{) 17}$ <b>3 R2</b> | 12. $3 \overline{) 16}$ <b>5 R1</b> |
| 13. $3 \overline{) 14}$ <b>4 R2</b> | 14. $5 \overline{) 17}$ <b>3 R2</b> | 15. $7 \overline{) 18}$ <b>2 R4</b> | 16. $3 \overline{) 15}$ <b>5</b>    |

Solve the problem.

17. Cheeky has 61 nuts to store for winter. If 5 nuts will fit in each hole in the tree, how many holes will be filled?

**12 holes**

## Reteaching 89

Name \_\_\_\_\_

Find  $79 \div 3$ .

There are two 3s in 7. Put the 2 above the 7.

Multiply. Subtract. Bring down the 9.

There are six 3s in 19. Put the 6 above the 9.

Divide.

|                                    |                                     |                                     |                                     |
|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. $4 \overline{) 15}$ <b>3 R3</b> | 2. $3 \overline{) 95}$ <b>31 R2</b> | 3. $5 \overline{) 17}$ <b>3 R2</b>  | 4. $3 \overline{) 18}$ <b>6 R0</b>  |
| 5. $3 \overline{) 15}$ <b>5</b>    | 6. $4 \overline{) 16}$ <b>4</b>     | 7. $5 \overline{) 17}$ <b>3 R2</b>  | 8. $7 \overline{) 18}$ <b>2 R4</b>  |
| 9. $4 \overline{) 17}$ <b>4 R1</b> | 10. $6 \overline{) 19}$ <b>3 R1</b> | 11. $3 \overline{) 16}$ <b>5 R1</b> | 12. $5 \overline{) 17}$ <b>3 R2</b> |

I'm the remainder in each answer.

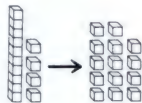


17. Here's a way to record your work when you divide. Work in groups and use place-value materials to explain what is happening in each step.

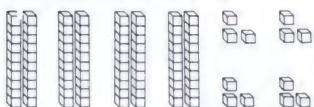
Divide the tens into 4 equal groups.  
How many tens in each group? **2**  
How many tens left over? **1**



Rename the left-over ten as ones. How many ones altogether? **14**



Divide the ones into 4 equal groups.  
How many ones in each group? **3**  
How many ones left over? **2**



$$\begin{array}{r} 2 \\ 4 \overline{)94} \\ \underline{8} \phantom{0} \\ 1 \phantom{0} \end{array}$$

Divide.

Multiply.  $2 \times 4 = 8$

Subtract and compare.

Is 1 less than 4? **Yes**

$$\begin{array}{r} 23 \text{ R}2 \\ 4 \overline{)94} \\ \underline{8} \phantom{0} \\ 14 \phantom{0} \\ \underline{12} \phantom{0} \\ 2 \phantom{0} \end{array}$$

Bring down.

The next digit is 4.

Divide.

Multiply.  $3 \times 4 = 12$

Subtract and compare.

Is 2 less than 4? **Yes**

Are there any more digits to bring down? **No**

What is the remainder? **2**

Check

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 92 \\ + 2 \\ \hline 94 \end{array}$$

Multiply the quotient and the divisor.

Add the remainder.

The result should be the dividend.

What do you think happens when you check an answer with a remainder of 0?

The product of the quotient and divisor is the dividend.

Divide. Work in groups. Use your place-value materials as you record your work.

18.  $4 \overline{)56}$

19.  $3 \overline{)93}$

20.  $5 \overline{)70}$

21.  $6 \overline{)96}$

22.  $2 \overline{)56}$

23.  $3 \overline{)58}$

24.  $62 \div 5$   
**12 R2**

25.  $95 \div 4$   
**23 R3**

26.  $75 \div 2$   
**37 R1**

27.  $90 \div 4$   
**22 R2**

28.  $84 \div 7$   
**12**

**Apply** Solve each problem.

29. Mr. Randall packed 48 shells in 4 boxes. He put the same number of shells in each box. How many shells did he put in each box?

**12 shells**

30. Barry got 14 shells last year and 23 shells this year. He chose 4 of the old shells and 16 new shells to divide equally among 5 friends. How many did he give to each friend?

**4 shells**

More Practice Set 89, page 384 **243**

## Assignment Guide

|          |                                     |
|----------|-------------------------------------|
| basic    | 1–10 even, 11–17, 18–28 even, 29–30 |
| average  | 1–10 odd, 11–17, 18–28 odd, 29–30   |
| enriched | 1–10 odd or even, 11–30             |

**More Practice Set 89, page 384**

## Follow-Up

**Extra Practice Find a pattern** Have students divide 25, 35, 45, 55, 65, 75, 85, and 95 by 3 and list their results in a table. [8 R1, 11 R2, 15, 18 R1, 21 R2, 25, 28 R1, 31 R2] Then ask students to describe a pattern in the remainders. [The remainder is always either 0, 1, or 2.] Emphasize that a remainder must always be less than the divisor.

## Reteaching Using Concrete Materials

Allow students to use counters to work through the exercises below.

$$\begin{array}{l} [11] \\ 4 \overline{)44} \end{array} \quad \begin{array}{l} [13R3] \\ 4 \overline{)55} \end{array} \quad \begin{array}{l} [16R2] \\ 4 \overline{)66} \end{array}$$

$$\begin{array}{l} [19R1] \\ 4 \overline{)77} \end{array} \quad \begin{array}{l} [22] \\ 4 \overline{)88} \end{array} \quad \begin{array}{l} [24R3] \\ 4 \overline{)99} \end{array}$$

**Enrichment Try and check** Describe a number as follows and have students discover what number it is. "I am a two-digit number. My tens digit is the same as my ones digit. When you divide me by 2, 3, or 6, I have a remainder of 1." [55]

## Computer Assisted Instruction

Mathematics Courseware Series

- Division 2, Activity 1

## Enrichment 89

Name \_\_\_\_\_

**Leftovers**

1. I have burritos to put on 14 plates. Each plate must have the same number of burritos.

If I put 3 burritos on each plate, 2 burritos are left over.

How many burritos do I have? **44 burritos**

2. I have less than 50 tacos to put on platters. I can use any number of platters, they can be any size, but I need to have the same number of tacos on each.

If I put 3 tacos on each platter, 2 tacos will be left over.

If I put 4 tacos on each platter, 3 tacos will be left over.

If I put 5 tacos on each platter, 2 tacos will be left over.

If I put 6 tacos on each platter, 5 tacos will be left over.

How many tacos do I have? **47 tacos**

## Additional Resource 89

Name \_\_\_\_\_

**Additional Resource 89**

**Calculator Magic Squares**

You can use me to find the missing numbers in these magic squares. Here's how.

In these magic squares, the product of the three numbers in each row, column, and diagonal is the same. That product is called the *magic product*.

To find the missing numbers, first find the magic product. Press  $12 \times 9 \times 2$ . You see 216, the magic product.

Now find the missing number on the diagonal with 12 and 6. Press  $12 \times 6$ . You see 72. Press  $216 \div 72$ . You see 3, which is the missing number for that square. Find the other missing numbers in the same way.

Complete these magic squares.

1.

|    |     |    |
|----|-----|----|
| 20 | 1   | 50 |
| 25 | 10  | 4  |
| 2  | 100 | 5  |

Magic product **1,000**

2.

|     |    |    |
|-----|----|----|
| 7   | 4  | 98 |
| 196 | 14 | 1  |
| 2   | 49 | 28 |

Magic product **2,744**

## Daily Maintenance

**Estimation** First estimate each product. Then compute the exact product.

- $4 \times 628$  [2,400, 2,512]
- $8 \times 343$  [2,400, 2,744]
- $7 \times 1,089$  [7,000, 7,623]
- $2 \times 3,466$  [6,000, 6,932]
- $9 \times 2,908$  [27,000, 26,172]



## Objective 90

Divide a two-digit number by a one-digit number to get a two-digit quotient with a zero in the ones place.

### Lesson Theme

Home Activities: Photography

### Materials

- Tens, Units (Punchouts or Math Kit)

## Introduction

**Using Concrete Materials** Using 4 ten-sticks and 3 unit counters, have students separate them into 4 equal groups. (One ten-stick should be placed in each group. There are not enough unit counters to divide, so 3 counters are left over.) Emphasize that each group has one ten-stick meaning ten and no ones. Write the exercise on the board.

$$\begin{array}{r} 10R3 \\ 4 \overline{)43} \end{array}$$

## Using the Pages

**Teach** Discuss estimating answers using compatible numbers. Accept both 10 and 11 as estimated answers to  $87 \div 8$ . As you work through the example, emphasize that for each digit brought down from the dividend, a digit must be placed in the quotient. Sometimes this digit is a zero. Point out that the answer to the example, 10 R7, is reasonable because it is close to both 10 and 11.

**Try** Students can use compatible numbers to see if the quotients are reasonable in Exercises a–c.

**Error Analysis** In Exercise d, watch for students who add the remainder to the quotient before multiplying by the divisor. Ask these students to explain the problem in their own words.

**Practice Estimation** Encourage students to estimate quotients by thinking about compatible numbers. For example, to estimate  $95 \div 9$ , students could think about  $90 \div 9$ . Since  $9 \times 10 = 90$ , 10 is a reasonable estimate for  $95 \div 9$ . Students might also think about  $99 \div 9$ . Since  $9 \times 11 = 99$ , 11 is also a reasonable answer.

You may want students to check some of their answers.

**Mental Math** For Exercises 23–27, some students might notice that they can quickly find the incorrect quotients by multiplying the digit in the ones place of the given quotient by the divisor and adding the remainder to the product. The digit in the ones place of (Continued to page 245.)

## Zeros in Two-Digit Quotients

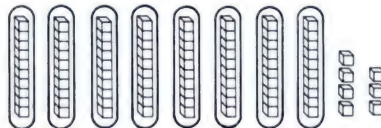
Luisa wants to bring each of 8 friends the same souvenir from her vacation. She has 87 cents to spend. What is the greatest amount she can spend for each souvenir? How much will she have left?

Find  $87 \div 8$ .

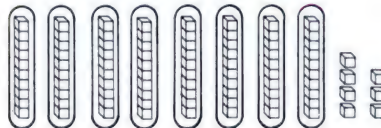
You can use *compatible numbers* to estimate this quotient. Find a number close to 87 that you can divide by 8 mentally. What is an estimate of the quotient?

**$80 \div 8 = 10$ ; Also,  $88 \div 8 = 11$**   
Now divide. Use the pictures to help explain each step.

Divide the tens.



Divide the ones. Can you make 8 equal groups of ones? **No**



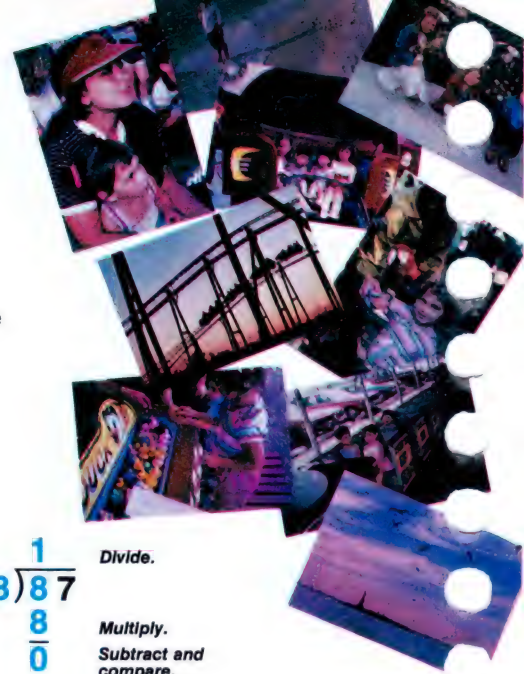
What is  $87 \div 8$ ? Is the answer close to your estimate? How much can Luisa spend for each souvenir? How much money will she have left over?

**10 R7; yes; 10 cents; 7 cents left over**

**Try** Divide. Explain orally why your answers are reasonable.

a.  $5 \overline{)54}$       b.  $2 \overline{)81}$       c.  $76 \div 7$

d. Check the division.  $6 \overline{)94}$   
 **$(6 \times 15) + 4 = 94$**   
**244**



$$\begin{array}{r} 1 \\ 8 \overline{)87} \\ 8 \phantom{0} \\ \hline 0 \end{array}$$

Divide.

Multiply.  
Subtract and compare.

$$\begin{array}{r} 10R7 \\ 8 \overline{)87} \\ 8 \phantom{0} \\ \hline 07 \\ 0 \phantom{0} \\ \hline 7 \end{array}$$

Bring down.  
The next digit is 7.

Divide. Each time you bring down a digit and divide, you must write a digit in the quotient. Sometimes this digit is zero.

Multiply.  
Subtract and compare.  
The remainder is 7.



## Practice 90

Name \_\_\_\_\_

What did the big flower say to the little flower?  
To find out, divide. Then find your answer in the code. Cross out the letter next to it. Write the remaining letters, in order, in the blanks below.

| Code  |   |
|-------|---|
| 11    |   |
| 31    |   |
| 50 R2 | H |
| 20 R3 |   |
| 40    |   |
| 6 R4  |   |
| 70 R1 | I |
| 10 R1 |   |
| 20    |   |
| 20 R2 |   |
| 90    | B |
| 14 R1 |   |
| 11 R5 |   |
| 13 R5 |   |
| 30 R3 | U |
| 12 R2 |   |
| 80 R2 | D |

1.  $2 \overline{)16}$       2.  $2 \overline{)40}$       3.  $5 \overline{)134}$       4.  $4 \overline{)182}$       5.  $8 \overline{)181}$       6.  $7 \overline{)196}$       7.  $6 \overline{)174}$       8.  $9 \overline{)199}$       9.  $4 \overline{)183}$       10.  $11 \overline{)185}$       11.  $3 \overline{)180}$       12.  $6 \overline{)185}$

H I B U D I

## Reteaching 90

Name \_\_\_\_\_

Divide:

|        |        |        |    |    |
|--------|--------|--------|----|----|
| 31     | 310 R1 | 216 R1 | 61 | 01 |
| 216 R1 | 61     | 01     |    |    |
| 01     |        |        |    |    |

The first automobile trip from New York to San Francisco was in 1903. How long did it take?

Divide. Place the letters of your answers in the blanks below.

|                          |                           |                           |                           |
|--------------------------|---------------------------|---------------------------|---------------------------|
| 1. $5 \overline{)150}$ Y | 2. $3 \overline{)90}$ D   | 3. $4 \overline{)180}$ T  | 4. $2 \overline{)180}$ O  |
| 5. $5 \overline{)152}$ W | 6. $3 \overline{)92}$ Y   | 7. $4 \overline{)183}$ I  | 8. $2 \overline{)181}$ S  |
| 9. $6 \overline{)185}$ F | 10. $2 \overline{)181}$ Y | 11. $7 \overline{)174}$ A | 12. $3 \overline{)182}$ F |

F I F T Y T W O  
20 R2 20 R3 10 R5 20 30 R1 30 R2 10 R2 40  
D A S  
30 10 R4 10 40 R1



## Practice Divide.

- |                                       |                                       |                                       |  |  |  |
|---------------------------------------|---------------------------------------|---------------------------------------|--|--|--|
| 1. $4 \overline{)40}$<br><b>10 R8</b> | 2. $2 \overline{)20}$<br><b>10 R3</b> | 3. $3 \overline{)90}$<br><b>30 R0</b> | 4. $2 \overline{)40}$<br><b>20 R0</b>  | 5. $4 \overline{)42}$<br><b>10 R2</b>  | 6. $6 \overline{)72}$<br><b>12 R0</b>  |
| 7. $9 \overline{)98}$<br><b>10 R8</b> | 8. $6 \overline{)63}$<br><b>10 R3</b> | 9. $4 \overline{)89}$<br><b>22 R1</b> | 10. $2 \overline{)61}$<br><b>30 R1</b> | 11. $3 \overline{)92}$<br><b>30 R2</b> | 12. $5 \overline{)59}$<br><b>11 R4</b> |
| 13. $62 \div 6$<br><b>10 R2</b>       | 14. $83 \div 4$<br><b>20 R3</b>       | 15. $95 \div 8$<br><b>11 R7</b>       | 16. $71 \div 4$<br><b>17 R3</b>        | 17. $62 \div 3$<br><b>20 R2</b>        |  |
| 18. $97 \div 9$<br><b>10 R7</b>       | 19. $93 \div 3$<br><b>31 R0</b>       | 20. $87 \div 8$<br><b>10 R7</b>       | 21. $99 \div 7$<br><b>14 R1</b>        | 22. $85 \div 3$<br><b>28 R1</b>        |  |

Check each division. If the answer is wrong, give the correct answer.

- |  |  |  |  |  |
|--|--|--|--|--|
| 23. $2 \overline{)80}$<br><b>correct</b> | 24. $8 \overline{)94}$<br><b>11 R6</b> | 25. $3 \overline{)61}$<br><b>20 R1</b> | 26. $3 \overline{)49}$<br><b>correct</b> | 27. $2 \overline{)97}$<br><b>48 R1</b> |
|--|--|--|--|--|

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve Problems 28–31. Tell which method you used.

28. Luisa took 75 pictures while she was on vacation. She can put 8 pictures on each page of her album. Will she fill 10 pages?  
**No; M**
30. Joan used 3 rolls of film to take 72 pictures. Each roll has the same number of pictures. How many pictures are on each roll?  
**24 pictures; P**
32. **CALCULATOR** Work in groups of 4 and use your calculator to find the answer to this problem.

It costs 8 cents to have a print made from a negative. How many prints can Brian have made for 75 cents? How much money will be left?

**9 prints; 3 cents**

Which part of the calculator display tells how many prints Brian can have made? How can you use the display to find the number of cents left? Explain your reasoning.

**The whole number part. Multiply 9 times 8 and subtract the product from 75. Answers will vary. See margin.**

29. Curt used 21 rolls of film on his vacation. Each roll has 12 pictures. Did he take more or less than 200 pictures?  
**More than 200 pictures; M**

31. Jan has 85 pictures. She can put 4 on each page of an album. She thinks 20 pages will be enough. Is she correct?  
**No; M**

33. **CALCULATOR** Use your calculator to solve Problem A on page 242.

What part of the display can be used to answer each question? Explain your answer.

**See margin.**



More Practice Set 90, page 384 245

## Assignment Guide

basic 1–21 odd, 23–33  
average 1–15 odd, 23–33  
enriched 1–12 even, 13–33

**More Practice Set 90, page 384**

(Continued from page 244.)

the sum should be equal to the ones digit in the dividend. If not, the quotient is incorrect.

## Apply Problem Solving

**Choosing a computation method** You might want to work Problems 28–31 in class since Problems 28, 29, and 31 can be done mentally. Have students explain their reasoning.

**Calculator** In Problems 32 and 33, students should realize that calculators show remainders as decimals. For Problem 33, students will find that a calculator displays the quotient of  $94 \div 4$  as 23.5. Point out that the decimal part of the quotient should not be written as “R 0.5.” You may wish to tell students that 0.5 is equal to one half, and that in this example the remainder would be 2, since one half of the divisor, 4, is 2.

## Follow-Up

**Enrichment Try and check** Have students divide the numbers 80–89 by each of the digits 2–8 to find which numbers always have a remainder. [83, 89]

## Enrichment 90

Name \_\_\_\_\_ E90

**A Remainder Game**

Make a set of 30 cards for each player. Each set has 3 cards for each of the digits 0–9.

Each player mixes the set, draws 3 cards, and forms a division problem like the one on the right. The score on each play is the remainder.

Each player has 10 plays. The one with the highest score at the end of the game is the winner.

1. What is the remainder for the above problem? 1

2. What is the greatest possible remainder you can get by rearranging these cards? 2

Arrange the cards below to make division problems with the greatest possible remainder.

3.  $\begin{array}{|c|c|c|} \hline 2 & 8 & 4 \\ \hline \end{array}$  Greatest possible remainder 2

4.  $\begin{array}{|c|c|c|} \hline 3 & 2 & 6 \\ \hline \end{array}$  Greatest possible remainder 5

5.  $\begin{array}{|c|c|c|} \hline 9 & 5 & 4 \\ \hline \end{array}$  Greatest possible remainder 4

Make 2 sets of cards and play this game with a friend.

## Additional Resource 90

Name \_\_\_\_\_ Additional Resource 90

**Maintenance**

Multiply or divide.

|                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 1. $5 \times 3 = 15$  | 2. $8 \times 4 = 32$  | 3. $12 \div 4 = 3$    |
| 4. $18 \div 6 = 3$    | 5. $7 \times 5 = 35$  | 6. $35 \div 7 = 5$    |
| 7. $0 \div 4 = 0$     | 8. $0 \times 7 = 0$   | 9. $24 \div 3 = 8$    |
| 10. $9 \times 5 = 45$ | 11. $9 \times 4 = 36$ | 12. $36 \div 6 = 6$   |
| 13. $5 \times 5 = 25$ | 14. $32 \div 8 = 4$   | 15. $3 \times 9 = 27$ |
| 16. $7 \times 3 = 21$ | 17. $49 \div 7 = 7$   | 18. $54 \div 6 = 9$   |
| 19. $5 \div 1 = 5$    | 20. $81 \div 9 = 9$   | 21. $63 \div 7 = 9$   |
| 22. $12 \div 2 = 6$   | 23. $4 \times 5 = 20$ | 24. $8 \times 7 = 56$ |
| 25. $8 \times 5 = 40$ | 26. $9 \div 3 = 3$    | 27. $0 \div 9 = 0$    |
| 28. $6 \times 6 = 36$ | 29. $15 \div 3 = 5$   | 30. $42 \div 7 = 6$   |
| 31. $8 \times 6 = 48$ | 32. $16 \div 2 = 8$   | 33. $24 \div 6 = 4$   |
| 34. $5 \times 0 = 0$  | 35. $4 \div 1 = 4$    | 36. $7 \times 4 = 28$ |
| 37. $5 \div 6 = 0$    | 38. $9 \times 9 = 81$ | 39. $1 \times 1 = 1$  |

## Daily Maintenance

- $195 + 62$  [257]
- $362 + 484$  [846]
- $3,784 + 2,042$  [5,826]
- $493 + 71 + 260$  [824]
- $9,234 + 325 + 2,048$  [11,607]
- $8,973 + 2,512 + 134$  [11,619]

## Answers, page 245

32. A key sequence would be:

PRESS: 75  $\div$  8  $=$

DISPLAY: 9.375

PRESS: 9  $\times$  8  $=$  M+ 75  $-$  MR  $=$

DISPLAY: 3

33. PRESS: 94  $\div$  4  $=$

DISPLAY: 23.5

The decimal part of the display corresponds to the remainder.



## Objective 91

Divide a three-digit number by a one-digit number to get a three-digit quotient.

### Lesson Theme

Reading: Paul Bunyan

### Materials

- Book about Paul Bunyan (Optional)
- Hundreds, Tens, Units (Punchouts or Math Kit)

## Introduction

**Motivation Situation** Have a book about Paul Bunyan in class. Give students some statistics about him and ask them to point to objects in the classroom or give examples that might show a fact about his size or some of his deeds. If you do not have a book available, explain that Paul Bunyan was a legendary lumberjack hero capable of doing extraordinary deeds. Ask students familiar with stories about Paul Bunyan to share them with the class. Explain that these stories will have many exaggerations because they are legends.

## Using the Pages

**Teach** In this lesson and in the two lessons that follow, students will work in groups using place-value materials. You might want to have students refer to pages 438–441 for a review about group work. See pages 470–473 in this Teacher's Edition for the corresponding pages.

**Using Concrete Materials** For Example A, let students select the counters they think they will need to solve the problem. For Example B, group work should result in 2 groups of counters, each with 2 hundred-squares and 9 ten-sticks, with 1 unit remaining. This represents 290 R1.

As students model Examples A and B, it may be helpful to structure their groups by task. For example, one student displays the dividend, one student moves the counters into the "divisor groups," one student is responsible for trading or renaming when necessary, and one student records the answer in the resulting groups.

### Practice Using Concrete Materials

Remind students to count carefully when they exchange hundreds for tens and tens for ones.

**Apply Problem Solving** Writing an equation may help students to further understand the problems they have modeled.

(Continued on page 247.)

## One-Digit Divisors, Three-Digit Quotients

Remember hundreds, tens, and ones, and you'll understand how it's done.



- A. Paul Bunyan, the giant lumberman, climbed 984 feet to the top of a mountain in 6 equal strides. How long was each stride?

Work in groups of four. Use your place-value materials to find  $984 \div 6$ .

Discuss how to find the answer without using 984 ones. Then share your method with the students in another group. If they used a different method, decide which method you like better.

How long was each of Paul Bunyan's strides?

**164 feet**

- B. Use the steps below to find  $581 \div 2$ .

**Step 1** Show 5 hundreds, 8 tens, and 1 one.

**Step 3** Regroup the hundreds that are left. Divide the tens into 2 equal groups.

**Step 5** What is  $581 \div 2$ ? **290 R1**

**Step 2** Divide the hundreds into 2 equal groups.

**Step 4** Regroup the tens that are left. Divide the ones into 2 equal groups.



Use Practice 91, Reteaching 91, and Enrichment 91 after page 251. See note at top of page 247.

## Practice 91

Name: \_\_\_\_\_

Divide

|                       |                        |                        |                        |
|-----------------------|------------------------|------------------------|------------------------|
| 1. $\overline{2)314}$ | 2. $\overline{3)948}$  | 3. $\overline{5)575}$  | 4. $\overline{4)649}$  |
| 5. $\overline{8)946}$ | 6. $\overline{4)655}$  | 7. $\overline{7)870}$  | 8. $\overline{5)669}$  |
| 9. $\overline{5)749}$ | 10. $\overline{8)976}$ | 11. $\overline{3)953}$ | 12. $\overline{7)800}$ |

Trace through the answers in order to help the ducks find their baby.

QUACK!

## Reteaching 91

Name: \_\_\_\_\_

Find  $537 \div 2$ .

Divide

|                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 1. $\overline{2)438}$ | 2. $\overline{6)811}$ | 3. $\overline{5)623}$ |
| 4. $\overline{6)975}$ | 5. $\overline{8)891}$ | 6. $\overline{5)713}$ |
| 7. $\overline{4)711}$ | 8. $\overline{7)997}$ | 9. $\overline{8)971}$ |





**Try** Work in groups. Use your place-value materials to divide.

a.  $2 \overline{)246}$  **123**      b.  $3 \overline{)639}$  **213**      c.  $978 \div 5$   
**195 R3**

**Practice** Work in groups. Use your place-value materials to divide.

1.  $3 \overline{)393}$  **131**      2.  $4 \overline{)485}$  **121 R1**      3.  $2 \overline{)842}$  **421**  
4.  $3 \overline{)935}$  **311 R2**      5.  $6 \overline{)743}$  **123 R5**      6.  $5 \overline{)942}$  **188 R2**

7.  $525 \div 4$  **131 R1**      8.  $388 \div 2$  **194**  
9.  $849 \div 7$  **121 R2**      10.  $983 \div 6$  **163 R5**

**Apply** Use your place-value materials to solve each problem.

11. Paul Bunyan drank 424 quarts of milk. How many gallons is this?  
(4 quarts = 1 gallon)  
**106 gallons**
12. Paul's cook used 955 eggs in 5 days. He used the same number of eggs each day. How many eggs did the cook use each day?  
**191 eggs**
13. One day, Paul cut down 475 trees. He put them into 4 equal stacks of 117 trees and had 7 trees left over. Explain how you can use this information to find  $475 \div 4$ .  
**See margin.**
14. Another time Paul put the trees he cut into 3 stacks of 112. There were 2 trees left over. How many trees had Paul cut down?  
**338 trees**

More Practice Set 91, page 384 **247**

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–12 |
| average  | 1–13 |
| enriched | 1–14 |

Pages 246–251 contain a 3-lesson sequence that moves from concrete to symbolic. First use the student pages for all lessons. Then go back and assign ancillary pages and More Practice sets for the lessons.

**More Practice Set 91, page 384**

(Continued from page 246.)

**Multiple step** Problem 14 is a multiple-step problem involving multiplication and addition. Have students write an equation to help them solve this problem.  $(112 \times 3) + 2 =$  . Point out that these steps are the steps used to check the division problem  $338 \div 3$ .

**Make a table** Give students this problem. Every step Paul took covered 5 yards. For every 2 steps that Paul took, Johnny took 15 steps. How many steps would it take each to go 100 yards? [Paul: 20 steps, Johnny: 150 steps]

## Follow-Up

**Enrichment Try and check** Johnny Inkslinger lived up to his name. Have students find what the digits were in the following exercises on which he spilled ink.

|  |   |  |
|--|---|--|
| $3 \overline{)5 \begin{smallmatrix} 175 \\ [25] \end{smallmatrix}}$      | $\begin{smallmatrix} 248 \\ 744 \\ [3] \end{smallmatrix}$                 | $3 \overline{)4 \begin{smallmatrix} 24 \\ [73] \end{smallmatrix}}$             |
| $4 \overline{)8 \begin{smallmatrix} [1] \\ 17 \\ [6] \end{smallmatrix}}$ | $6 \overline{)8 \begin{smallmatrix} [1] \\ 41 \\ [46] \end{smallmatrix}}$ | $15 \overline{)R \begin{smallmatrix} [2] [2] \\ 762 \\ [5] \end{smallmatrix}}$ |

## Enrichment 91

Name \_\_\_\_\_ **E91**

**Parentheses**

In an equation, parentheses tell you which operation to do first.

$6 + 696 - 6 = n$        $16 - 696 - 6 = n$   
 $6 + 115 = n$        $702 - 6 = n$   
 $122 = n$        $117 = n$

Find each answer.

1.  $432 - 18 - 51 = n$  **144**

2.  $1425 \div 21 = 5 = n$  **170**

3.  $1720 - 61 + 7 = n$  **127**

4.  $2 \times 1327 - 31 = n$  **218**

5.  $1990 - 91 \div 2 = n$  **108**

6.  $1771 \div 371 - 8 = n$  **101**

Place parentheses in each equation to make it true. **Answers to Exercise 11 may vary.**

7.  $600 \div 5 - 5 = 121$       8.  $625 - 51 \div 4 = 129$   
9.  $932 - (8 - 4) = 233$       10.  $888 - 8) = 2 = 440$   
11.  $7 \times (102 - 3) = 238$       12.  $(720 - 9) \times 4 = 320$   
13.  $8 \times (8 \times 8) = 128$       14.  $543 - (7 - 4) = 181$   
15.  $7 \times 60 - (5 - 4) = 420$       16.  $(450 + 150) - 5 = 120$

## Additional Resource 91

Name \_\_\_\_\_ **Additional Resource 91**

**Calculator Using Division to Find Missing Factors**

You can use me to find a missing factor in a multiplication exercise. Use the  $\square$  key. Here's how.

3  $\square$   $\square$  420  
Press: 420  $\square$  3  $\square$   
You see: 140  
So 3  $\square$  140  $\square$  420

Use your calculator to find the missing factor.

|   |  |
|---|--|
| 1. 2 $\square$ <b>360</b> $\square$ 720 | 2. 3 $\square$ <b>240</b> $\square$ 720  |
| 3. 4 $\square$ <b>180</b> $\square$ 720 | 4. 5 $\square$ <b>144</b> $\square$ 720  |
| 5. 6 $\square$ <b>120</b> $\square$ 720 | 6. 8 $\square$ <b>90</b> $\square$ 720   |
| 7. 9 $\square$ <b>80</b> $\square$ 720  | 8. 2 $\square$ <b>252</b> $\square$ 504  |
| 9. 3 $\square$ <b>168</b> $\square$ 504 | 10. 4 $\square$ <b>126</b> $\square$ 504 |
| 11. 6 $\square$ <b>84</b> $\square$ 504 | 12. 7 $\square$ <b>72</b> $\square$ 504  |
| 13. 8 $\square$ <b>63</b> $\square$ 504 | 14. 2 $\square$ <b>120</b> $\square$ 240 |
| 15. 3 $\square$ <b>80</b> $\square$ 240 | 16. 4 $\square$ <b>60</b> $\square$ 240  |

Challenge: Find the missing factors.

1  $\square$  **81**  $\square$  81      3  $\square$  **27**  $\square$  81      9  $\square$  **9**  $\square$  81

## Computer Assisted Instruction

Mathematics Courseware Series

- Division 2, Activity 2
- Mathematics Action Games
- Star Maze, Master Level

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- $45 \div 9$  [5]
- $8 \div 4$  [2]
- $32 \div 8$  [4]
- $27 \div 3$  [9]
- $25 \div 5$  [5]

**Answers, page 247**

See page 273 of this Teacher's Edition.



## Objective 92

Divide a three-digit number by a one-digit number to get a three-digit quotient with a zero in the tens or ones place.

### Lesson Theme

Reading: Paul Bunyan

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)
- Inch rulers (Teaching Aid F, Punchouts or Math Kit)

## Introduction

**Warm-Up Review** Review basic division facts. Have each student write 1–9 on a sheet of paper as shown below. The students point to the correct answer when you call a fact. Spot-check students' answers.

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

## Using the Pages

**Teach** *Using Concrete Materials* For Example A, students should display 9 hundred-squares, 4 ten-sticks, and 5 units. One hundred can be placed into each of the 9 groups. The 4 ten-sticks must be traded for 40 units, and the resulting 45 units can be evenly divided into 9 groups with 1 hundred-square and 5 units per group. Have students record the quotient as they work and point out the proper placement of the zero in the quotient. Students should recognize that the zero is in the tens place because there are zero tens in the 9 groups. For Example B, students should end up with 4 equal groups of 2 hundred-squares. There will be 2 remaining units. Encourage students to write  $802 \div 4$  as  $4 \overline{)802}$  to help them visualize the placement of zeros in the quotient. For Example C, students can find  $6 \div 2$  and then write the 2 zeros to the right of their partial quotient.

**Practice** Point out to students that one or two zeros may need to be placed in each quotient and that some exercises have remainders.

**Mental math** Remind students that after the first digit is placed in the quotient, there must be a digit written for each of the remaining digits in the dividend. Sometimes, as in Exercises 18 and 19, there are fewer digits in the quotient than in the dividend.

(Continued on page 249.)

## Zeros in Three-Digit Quotients

See *Using the Pages* for a discussion of these examples.

- A.** Paul Bunyan once stopped a flooding river by freezing it and chopping it into 9 equal sections. If the river was 945 miles long, how long was each section?

Work with 3 other students. Use your place-value materials to find  $945 \div 9$ .

How do you show 945 with your place-value materials? What do you divide first? What is the result?

What is the next step? What is the result? Continue until you find the answer to the problem.

How long was each section of river?

**105 miles**

- B.** Find  $802 \div 4$ .

Explain to the students in another group how you can use place-value materials to find the answer. What is  $802 \div 4$ ?

**200 R2**

- C.** Find  $600 \div 2$ .

Discuss how you can find this quotient mentally.

**300**

**Try** Work in groups. Use your place-value materials to divide.

$$a. 2 \overline{)260}$$

$$b. 3 \overline{)201}$$

$$c. 706 \div 7$$

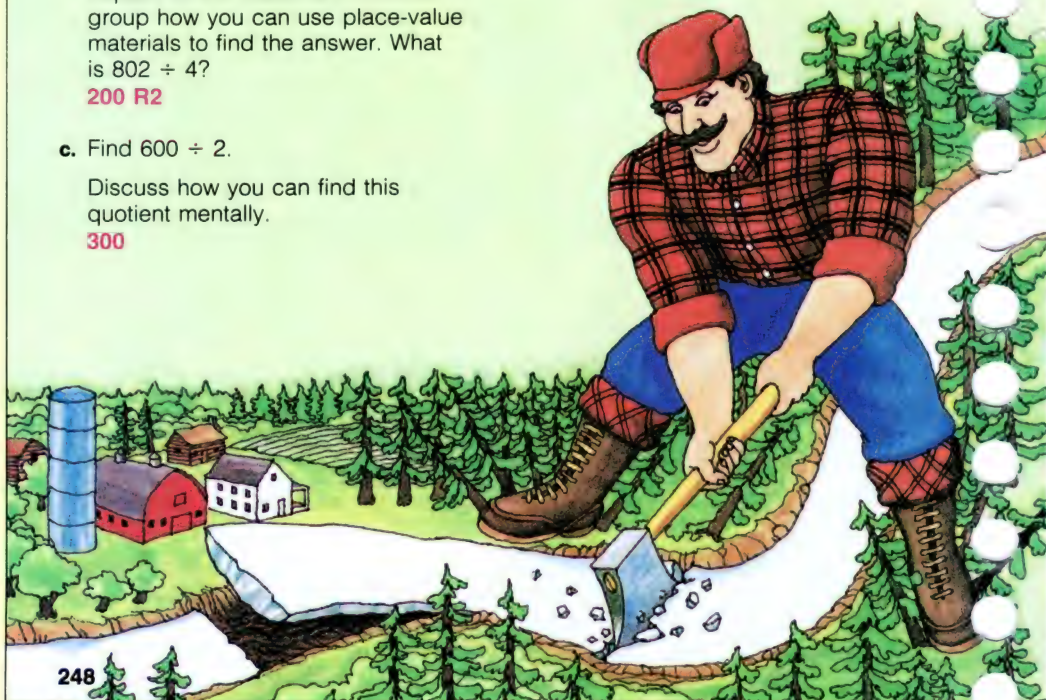
$$100 \text{ R6}$$

- d.** Explain how you can find this quotient mentally.

$$600 \div 3$$

$$200$$

**Explanations will vary.**



Use Practice 92, Reteaching 92, Enrichment 92 after page 251. See note at top of page 247.

## Practice 92

Name \_\_\_\_\_

Divide. Then, in the picture below, connect the dots in the order the answers are given.

1.  $2 \overline{)812}$  **406** 2.  $4 \overline{)1816}$  **454** 3.  $6 \overline{)780}$  **130** 4.  $3 \overline{)301}$  **100 R1**

5.  $3 \overline{)600}$  **200** 6.  $9 \overline{)998}$  **110 R8** 7.  $5 \overline{)553}$  **110 R3** 8.  $4 \overline{)1404}$  **351**

9.  $2 \overline{)880}$  **440** 10.  $3 \overline{)992}$  **330 R2** 11.  $2 \overline{)480}$  **240** 12.  $5 \overline{)504}$  **100 R4**

13.  $900 \div 9 =$  **100** 14.  $650 \div 6 =$  **108 R2** 15.  $770 \div 7 =$  **110**

16.  $208 \div 2 =$  **104** 17.  $280 \div 2 =$  **140** 18.  $209 \div 2 =$  **104 R1**

19.  $961 \div 4 =$  **240 R1** 20.  $661 \div 3 =$  **220 R1** 21.  $905 \div 6 =$  **150 R5**

22.  $941 \div 2 =$  **470 R1** 23.  $810 \div 4 =$  **202 R2** 24.  $801 \div 4 =$  **200 R1**

This animal at the zoo loves to play and imitate you!

Start at 204 and follow the path of the answers to the division problems. Connect the dots in the order the answers are given.

204  
100 R1  
130  
110 R3  
110  
108 R2  
104  
104 R1  
150 R5  
220 R1  
240 R1  
470 R1  
406  
454  
351  
330 R2  
240  
202 R2  
200 R1  
204

## Reteaching 92

Name \_\_\_\_\_

Find  $645 \div 6$ .

How many 6s in 470? 10  
Put me in the answer.

What do bees do with their honey?

Divide. Write the letters below.

1.  $8 \overline{)1965}$  Y **245 R3** 2.  $6 \overline{)632}$  T **105 R2** 3.  $6 \overline{)840}$  C **140**

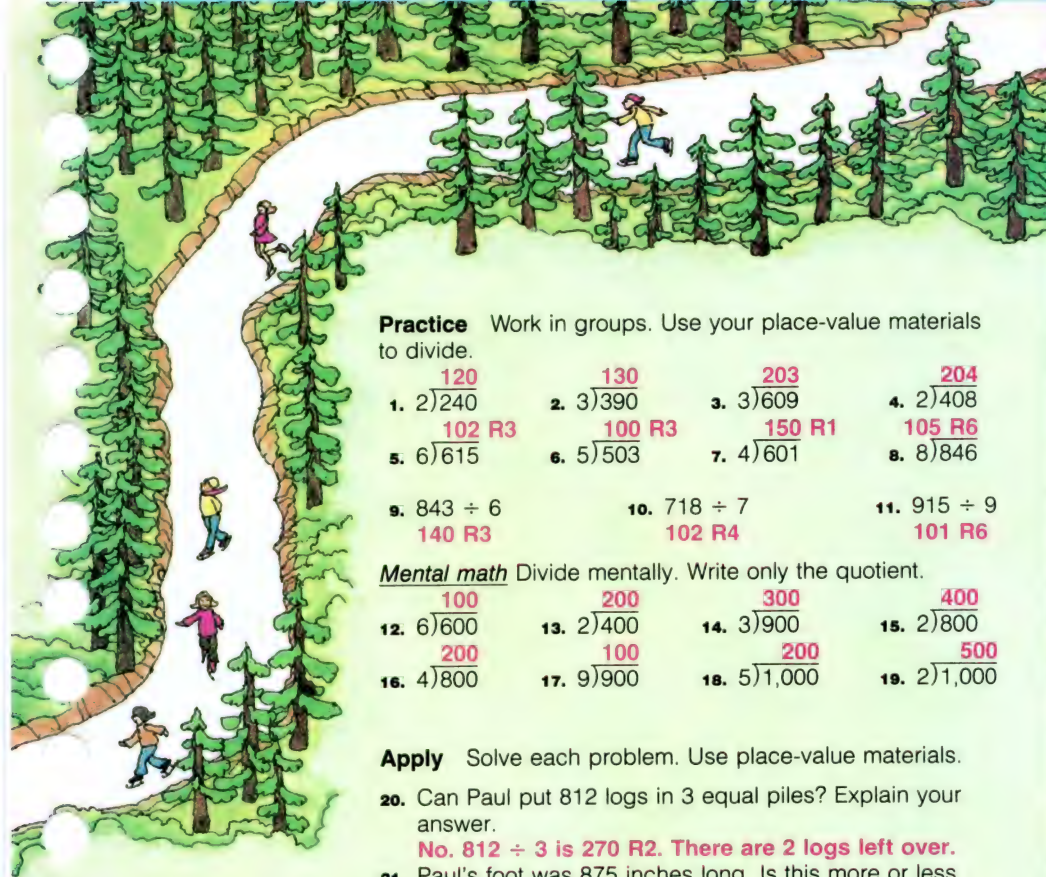
4.  $5 \overline{)150}$  I **30** 5.  $3 \overline{)603}$  E **201** 6.  $3 \overline{)721}$  H **240 R1**

7.  $5 \overline{)150}$  L **30** 8.  $3 \overline{)902}$  L **300 R2** 9.  $7 \overline{)705}$  E **100 R5**

T H E Y C E L L I T

240 R1 201 120 R5 140 100 R5 300 R2 100 R2 110 105 R2





**Practice** Work in groups. Use your place-value materials to divide.

- |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|
| 1. $2 \overline{)240}$ | 2. $3 \overline{)390}$ | 3. $3 \overline{)609}$ | 4. $2 \overline{)408}$ |
| 5. $6 \overline{)615}$ | 6. $5 \overline{)503}$ | 7. $4 \overline{)601}$ | 8. $8 \overline{)846}$ |
| 9. $843 \div 6$        | 10. $718 \div 7$       | 11. $915 \div 9$       |                        |

**Mental math** Divide mentally. Write only the quotient.

- |                         |                         |                           |                           |
|-------------------------|-------------------------|---------------------------|---------------------------|
| 12. $6 \overline{)600}$ | 13. $2 \overline{)400}$ | 14. $3 \overline{)900}$   | 15. $2 \overline{)800}$   |
| 16. $4 \overline{)800}$ | 17. $9 \overline{)900}$ | 18. $5 \overline{)1,000}$ | 19. $2 \overline{)1,000}$ |

**Apply** Solve each problem. Use place-value materials.

20. Can Paul put 812 logs in 3 equal piles? Explain your answer.  
**No.  $812 \div 3$  is 270 R2. There are 2 logs left over.**
21. Paul's foot was 875 inches long. Is this more or less than 100 times the length of your foot? Explain your reasoning.

**Answers will vary. See Using the Pages.**

## CALCULATOR

Use your calculator to find each mystery number.

- |   |   |
|---|---|
| 1. This number is less than 30. When it is divided by 6, the remainder is 4. When it is divided by 5, the remainder is 3. What is the number? | 2. This number is less than 50. When it is divided by 7, the remainder is 3. When it is divided by 8, the remainder is 5. What is the number? |
|---|---|

28

45

More Practice Set 92, page 385 249

## Assignment Guide

basic 1-11 odd, 12-21  
 average 1-10 even, 12-21  
 enriched 1-11 odd or even, 12-21

**More Practice Set 92, page 385**

(Continued from page 248.)

**Apply Problem Solving** For Problem 21, students use rulers to measure their feet. Students may use estimation by rounding the measure of Paul's foot to 900 inches. In most cases, the length of Paul's foot will be more than 100 times the length of a student's foot.

## Calculator, page 249

**Use logical reasoning** Students can use the following key sequence to solve Problem 1. Start with the highest possible number 29, subtract the remainder, and divide by the number. Continue until the answer is a whole number.

$$29 \div 4 \div 6 \div 4.1666 \dots$$

$$28 \div 4 \div 6 \div 4$$

Repeat using 28 and the key sequence with 5 as the divisor.

$$28 \div 3 \div 5 \div 5$$

Since both answers are whole numbers, 28 is the number that satisfies all the conditions.

**Make a table** Students could also make a table to solve the problems.

|    | Remainders when divided by |   |
|----|----------------------------|---|
|    | 6                          | 5 |
| 29 | 5                          | 4 |
| 28 | 4                          | 3 |
| 27 | 3                          | 2 |

## Follow-Up

**Extra Practice Write a problem** Have students make up division word problems about legendary heroes or imaginary creatures.

**Computer Assisted Instruction** Mathematics Courseware Series  
 • Division 2, Activity 4

## Daily Maintenance

Complete each pattern.

- 3, 6, 9, 12, 15, 18
- 26, 24, 22, 20, 18, 16
- 55, 50, 45, 40, 35, 30
- 7, 14, 21, 28, 35, 42
- 20, 40, 60, 80, 100, 120

## Enrichment 92

Name \_\_\_\_\_ E92

**Equation Puzzles**

Write one + sign and one x sign to make a true sentence.

(23  7)  4 = 165  
 (23 x 7) + 4 = 165  
 161 + 4 = 165  
 165 = 165

This is a true sentence.

Make each equation a true sentence.

Use one + sign and one x sign.

1. 25  (12  12) = 169      2. (12  3)  14 = 210

Use one - sign and one ÷ sign.

3. 675  (27  18) = 75      4. (724  4)  5 = 144

Use two of these signs, +, -, x, ÷.

5. (32  6)  4 = 152      6. (17  18)  2 = 304

Use two of these signs, +, -, x, ÷.

7. (275  5)  7 = 62      8. (73  8)  9 = 593

Use two of these signs, +, -, x, ÷.

9. (48  7)  24 = 984      10. 18  (16  3) = 342

11. (344  16)  3 = 120      12. 726  (11  5) = 121

## Additional Resource 92

Name \_\_\_\_\_ Additional Resource 92

**Computer BASIC: INPUT Statements**

The INPUT statement lets you enter information that your program needs to complete its work. You enter the input while your program is running.

Because the computer must remember your input, it stores it in its memory. This memory location is given a letter name or address so that the computer can find it.

Type and run this program. After you type your age as input to the question, press RETURN or ENTER.

```

10 PRINT "HOW OLD ARE YOU?"
20 INPUT N
30 PRINT "GROWING UP AT "; N
40 END
  
```

N names the address where the computer stores your answer.

Type and run each of these programs. Use the numbers from the exercises as input and write the output.

```

10 REM INPUT FOR DIVISION
20 INPUT D
30 PRINT D/4
40 END
  
```

1. 756      2. 964      3. 532

```

10 REM MORE DIVISION
20 PRINT "ENTER YOUR NUMBER"
30 INPUT N
40 PRINT N: " DIVIDED BY 6=";
50 PRINT N/6
60 END
  
```

4. 882      5. 912



## Objective 93

Divide a two- or three-digit number by a one-digit number to get a one-, two-, or three-digit quotient.

### Lesson Theme

Consumer Topics: Sidewalk Stand

### Materials

- Centimeter Grid (Teaching Aid K)

## Introduction

**Warm-Up Review** Write these division exercises on the board and emphasize the correct placement of the digits in the quotient.

$$\begin{array}{r} [9] \\ 4 \overline{)36} \end{array} \quad \begin{array}{r} [8 \text{ R}1] \\ 3 \overline{)25} \end{array} \quad \begin{array}{r} [7 \text{ R}3] \\ 6 \overline{)45} \end{array}$$

## Using the Pages

**Teach** Tell students that this lesson shows them the algorithms for work they did with place-value materials on pages 246–249. Write  $6 \overline{)98}$  [16 R2] on the board. Have students work the exercise. Then write Example A on the board. Ask how it is similar to  $6 \overline{)98}$  and how it is different. [The divisors are the same and the first two digits in the dividends are the same; the example has a three-digit dividend.] Allow time for students to discuss and work through the example. Then work through it on the board emphasizing the steps:

**Divide, Multiply, Subtract, and Compare.** Work through Examples B and C, emphasizing the placement of the digits in the quotient and reminding students that for each digit brought down from the dividend, a digit must be written in the quotient.

The purpose of Example D is to encourage students to think ahead about the number of digits in the quotient in order to place the digits correctly. For example, the quotient will have the same number of digits as the dividend if the first digit of the dividend can be divided by the divisor.

**Practice** In Exercises 6–10, students can check by multiplying or by dividing. For Exercises 11–35, students can assess the reasonableness of their answers by using compatible numbers to estimate. Remind students to place the digits correctly in the quotient.

**Apply Problem Solving** Problem 37 can be solved by finding  $2 \overline{)235}$  or by recalling that an odd number is never divisible by 2.

(Continued on page 251.)

## Placing Digits in the Quotient

On pages 246–249 you divided 3-digit numbers using place-value materials. Here is a way to record your work. Work in groups of 4. For each example, use your place-value materials and discuss each step.

A. Find  $984 \div 6$ .

Estimate using compatible numbers:  
 $1,000 \div 5 = 200$

$$\begin{array}{r} 1 \\ 6 \overline{)984} \\ \underline{6} \phantom{00} \\ 38 \phantom{0} \\ \underline{36} \phantom{0} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Divide.  
Multiply.  
Subtract and compare.

$$\begin{array}{r} 16 \\ 6 \overline{)984} \\ \underline{6} \phantom{00} \\ 38 \phantom{0} \\ \underline{36} \phantom{0} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Bring down.  
Divide.  
Multiply.  
Subtract and compare.

$$\begin{array}{r} 164 \\ 6 \overline{)984} \\ \underline{6} \phantom{00} \\ 38 \phantom{0} \\ \underline{36} \phantom{0} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Bring down.  
Divide.  
Multiply.  
Subtract and compare.  
The remainder is 0.

What is the answer? Is it reasonable? How do you know? How can you check the answer?

**164; yes; it is close to the estimate;  $6 \times 164 = 984$**

250

B. Find  $128 \div 7$ .

Estimate using compatible numbers:  
 $140 \div 7 = 20$

$$\begin{array}{r} 1 \\ 7 \overline{)128} \\ \underline{7} \phantom{00} \\ 58 \phantom{0} \\ \underline{56} \phantom{0} \\ 2 \end{array}$$

Divide.  
Multiply.  
Subtract and compare.

$$\begin{array}{r} 18 \text{ R}2 \\ 7 \overline{)128} \\ \underline{7} \phantom{00} \\ 58 \phantom{0} \\ \underline{56} \phantom{0} \\ 2 \end{array}$$

Bring down.  
Divide.  
Multiply.  
Subtract and compare.  
The remainder is 2.

What is the answer? Explain why it is reasonable. **18 R2; it is close to the estimated answer.**

C. Find  $802 \div 4$ .

$$\begin{array}{r} 2 \\ 4 \overline{)802} \\ \underline{8} \phantom{00} \\ 0 \phantom{00} \\ \underline{0} \phantom{00} \\ 2 \end{array} \quad \begin{array}{r} 20 \\ 4 \overline{)802} \\ \underline{8} \phantom{00} \\ 0 \phantom{00} \\ \underline{0} \phantom{00} \\ 2 \end{array} \quad \begin{array}{r} 200 \text{ R}2 \\ 4 \overline{)802} \\ \underline{8} \phantom{00} \\ 0 \phantom{00} \\ \underline{0} \phantom{00} \\ 2 \end{array}$$

D. How many digits will be in each quotient? Explain how you can tell.

$$\begin{array}{r} 5 \overline{)630} \\ 7 \overline{)630} \\ 8 \overline{)63} \end{array}$$

**3 digits      2 digits      1 digit**  
**See Using the Pages.**

## Practice 93

Name \_\_\_\_\_ P93

Write how many digits will be in each quotient.

- $4 \overline{)500}$  **3**
- $7 \overline{)654}$  **2**
- $2 \overline{)408}$  **3**
- $5 \overline{)75}$  **2**

Divide.

- $10 \text{ R}1$   
 $7 \overline{)77}$
- $15 \text{ R}3$   
 $4 \overline{)63}$
- $158$   
 $2 \overline{)316}$
- $8 \text{ R}4$   
 $9 \overline{)76}$

- $80 \text{ R}1$   
 $3 \overline{)241}$
- $101$   
 $5 \overline{)505}$
- $12 \text{ R}3$   
 $9 \overline{)111}$
- $84$   
 $4 \overline{)336}$

- $552 \div 6 = 92$
- $493 \div 3 = 164 \text{ R}1$
- $309 \div 4 = 77 \text{ R}1$

Solve the problem.

16. How many 8-ounce glasses of water can be poured from a 100-ounce pitcher?  
**12 glasses**

## Reteaching 93

Name \_\_\_\_\_ R93

Find  $426 \div 5$ .

Put the 8 above the 2.

There are no 5s in 4. How many 5s in 42? 8.

Put Xs to show the digits in the answers.

- $4 \overline{)26}$  **X X**
- $6 \overline{)49}$  **X**
- $5 \overline{)55}$  **X X**
- $8 \overline{)57}$  **X**

- $3 \overline{)16}$  **X X X**
- $4 \overline{)17}$  **X X X**
- $7 \overline{)48}$  **X X**
- $2 \overline{)19}$  **X X**

Divide.

- $19 \text{ R}1$   
 $3 \overline{)58}$
- $16 \text{ R}1$   
 $3 \overline{)49}$
- $12 \text{ R}1$   
 $3 \overline{)37}$
- $9 \text{ R}1$   
 $3 \overline{)28}$

- $136 \text{ R}1$   
 $4 \overline{)545}$
- $95 \text{ R}1$   
 $5 \overline{)476}$
- $86 \text{ R}1$   
 $2 \overline{)173}$
- $55 \text{ R}1$   
 $6 \overline{)331}$

I'm the remainder in all these.



## Assignment Guide

|          |                                |
|----------|--------------------------------|
| basic    | 1–35 odd or even, 36–37        |
| average  | 1–35 odd or even, 36–38        |
| enriched | 1–10, 11–35 odd or even, 36–39 |

**More Practice Set 93,**  
page 385

(Continued from page 250.)

**Use physical models** For Problem 38, ask the same question for other divisors. In each case, the remainder can be any number less than the divisor. If students do not understand, have them separate objects into equal groups. If the number left over is greater than the number in each group (the divisor), they can make more groups. Only when the number left over is less than the number in each group can they stop.

## Follow-Up

**Reteaching** Let students use grid paper to help keep digits aligned properly.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Division 2, Activity 3

**Try** For each exercise, tell how many digits will be in the quotient. Then divide.

- a.  $5 \overline{)650}$  **3 digits; 130**    b.  $7 \overline{)631}$  **2 digits, 90 R1**    c.  $8 \overline{)70}$  **1 digit, 8 R6**    d.  $406 \div 3$  **3 digits, 135 R1**    e.  $803 \div 4$  **3 digits, 200 R3**

**Practice** Tell how many digits will be in each quotient.

1.  $4 \overline{)48}$  **2**    2.  $5 \overline{)48}$  **1**    3.  $4 \overline{)480}$  **3**    4.  $5 \overline{)480}$  **2**    5.  $8 \overline{)400}$  **2**

Check each division. If the answer is wrong, give the correct answer.

6.  $8 \overline{)516}$  **64 R4** **correct**    7.  $4 \overline{)516}$  **104** **129**    8.  $3 \overline{)650}$  **216 R2** **correct**    9.  $7 \overline{)714}$  **102** **correct**    10.  $5 \overline{)455}$  **91** **correct**

Divide. Explain why your answer is reasonable.

11.  $9 \overline{)86}$  **9 R5**    12.  $2 \overline{)609}$  **304 R1**    13.  $3 \overline{)59}$  **19 R2**    14.  $8 \overline{)875}$  **109 R3**    15.  $2 \overline{)356}$  **178**  
 16.  $4 \overline{)536}$  **134**    17.  $8 \overline{)544}$  **68**    18.  $7 \overline{)623}$  **89**    19.  $6 \overline{)341}$  **56 R5**    20.  $9 \overline{)915}$  **101 R6**  
 21.  $5 \overline{)209}$  **41 R4**    22.  $3 \overline{)407}$  **135 R2**    23.  $9 \overline{)623}$  **69 R2**    24.  $8 \overline{)783}$  **97 R7**    25.  $6 \overline{)156}$  **26**  
 26.  $198 \div 2$  **99**    27.  $849 \div 7$  **121 R2**    28.  $721 \div 4$  **180 R1**    29.  $579 \div 9$  **64 R3**    30.  $435 \div 8$  **54 R3**  
 31.  $657 \div 2$  **328 R1**    32.  $589 \div 5$  **117 R4**    33.  $768 \div 4$  **192**    34.  $777 \div 2$  **388 R1**    35.  $999 \div 5$  **199 R4**

**Apply** Solve each problem.

36. Sara has 200 ounces of juice. How many 8-ounce glasses can she fill?  
**25 glasses**
37. Can each of 235 students take a partner? Explain your answer. **No; the number of students is an odd number.**
38. **Thinking skills** In a division exercise, what numbers can be remainders if the divisor is 5?  
**0, 1, 2, 3, or 4**
39. **CALCULATOR** The  $\div$  and  $=$  keys are broken on your calculator. How can you use it to find  $432 \div 27$ ?  
**Match 27s to get to 432. Count how many 27s were added.**



Using Problem-Solving Strategies, page 426  
More Practice Set 93, page 385 **251**

## Enrichment 93

Name \_\_\_\_\_ E93

**One-Tree**

Match each digit in the quotient with a letter in the code box. Spell a tree name for each exercise.

Use this code for Exercises 1–3:

|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| 1 | C | B | L | A | M | P | E | H | R |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

1.  $6.435 \overline{)2112.870}$     2.  $27.718 \overline{)3183.154}$     3.  $735 \overline{)513.675}$

**PALM**    **BEECH**    **ELM**

Use this code for Exercises 4–6:

|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| U | C | A | S | I | P | E | R | H | N |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

4.  $5.496 \overline{)3116.488}$     5.  $238 \overline{)912.142}$     6.  $23.569 \overline{)2147.138}$

**PINE**    **ASH**    **ASPEN**

## Additional Resource 93

Name \_\_\_\_\_ Additional Resource 93

**Maintenance**

Write the letter of the correct group of items next to each price.

|                  |               |
|------------------|---------------|
| Pencil \$0.38    | Eraser \$0.73 |
| Scissors \$12.37 | Pen \$8.95    |
| Notebook \$2.79  |               |

1. \$6.57 **D**    A. scissors and 2 pencils  
 2. \$14.53 **F**    B. pen and 3 erasers  
 3. \$13.13 **A**    C. 6 notebooks  
 4. \$15.16 **G**    D. 9 erasers  
 5. \$6.34 **E**    E. 4 erasers and 9 pencils  
 6. \$55.80 **H**    F. pen and 2 notebooks  
 7. \$11.14 **B**    G. scissors and notebook  
 8. \$5.17 **I**    H. 20 notebooks  
 9. \$16.74 **C**    I. 4 pencils and 5 erasers

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- $\$0.28 \times 3$  [ $\$0.84$ ]
- $\$0.03 \times 7$  [ $\$0.21$ ]
- $\$2.15 \times 3$  [ $\$6.45$ ]
- $\$0.41 \times 12$  [ $\$4.92$ ]
- $23 \times \$2.48$  [ $\$57.04$ ]
- $25 \times \$1.07$  [ $\$26.75$ ]

**Using Problem-Solving Strategies, page 426**



## Objective 94

Divide an amount of money by a one-digit number.

### Lesson Theme

Consumer Topics: Buying Food

### Materials

- Money (Punchouts)

## Introduction

**Warm-Up Review** Divide.

1.  $142 \div 2$  [71]
2.  $564 \div 3$  [188]
3.  $304 \div 4$  [76]
4.  $250 \div 5$  [50]

## Using the Pages

**Teach** In Example A, each student should get 2 dollars and exchange the seventh dollar for 10 dimes. They should distribute 12 of the 13 dimes evenly and exchange the remaining dime for 10 pennies. Then they should distribute the 15 pennies evenly. Extend the activity by having students use play money to divide \$5.48 into 4 equal groups. [\$1.37]

In Example C, emphasize that when writing the quotient as money, a zero should be shown in the dollar's place as a statement that there are no dollars, as in \$0.39. Other teaching examples:

- \$5.20  $\div$  5 [\$1.04]  
\$9.75  $\div$  3 [\$3.25]

**Try Error Analysis** In Exercise b, watch for students who place the first digit of the quotient in the wrong place. To help these students, allow them to put a mark in the quotient each time they answer "none" to questions like "How many 4's in 3?" (See **Reteaching 94**.)

If students do not know how to begin Exercise e, ask, "How many coins were pennies?" [3] Then you might want to suggest that they start with a dollar bill, a quarter, and 3 pennies.

**Practice** Remind students that a zero should be placed in the dollar's place in the quotient when there are no dollars (Exercises 7 and 8).

**Apply Problem Solving** Whether a student has a correct answer or not, ask the students to explain how he or she found that answer.

**Make a table** Have students make a table for Problem 12. Suggest they label the columns of the table with the names of the coins in decreasing order of their value. Students can write the number of each type of coin in the columns until a total of 58¢ is reached.

## Dividing Money

- A.** Work with two other students in your class and use play money to explain how \$7.35 can be divided among the three of you.

What coins and bills did you exchange for other coins and bills? What order did you follow when you were exchanging? Were you concerned with the decimal point in the process?

What is  $\$7.35 \div 3$ ?

**\$2.45**

- B.** Brian Whitewing bought 3 bags of oranges for \$5.79. What was the cost of each bag?

Find  $\$5.79 \div 3$ .

Estimate using compatible numbers:  
 $\$6.00 \div 3 = \$2.00$

Think of \$5.79 as 579 cents. Divide. Then write the answer as dollars and cents.

$$\begin{array}{r} 193 \\ 3 \overline{)579} \\ \underline{3} \phantom{00} \\ 27 \phantom{0} \\ \underline{27} \phantom{0} \\ 09 \\ \underline{9} \\ 0 \end{array}$$

193 cents can be written as \$1.93.

The cost of each bag was \$1.93.

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## Practice 94

Name \_\_\_\_\_

P94

Divide. Write each answer as dollars and cents.

1.  $\$1.36 \div 2 =$  **\$0.68**
2.  $\$0.95 \div 5 =$  **\$0.19**
3.  $\$1.75 \div 7 =$  **\$0.25**
4.  $\$2.24 \div 4 =$  **\$0.56**
5.  $\$2.31 \div 3 =$  **\$0.77**
6.  $\$5.70 \div 6 =$  **\$0.95**
7.  $\$8.48 \div 8 =$  **\$1.06**
8.  $\$7.16 \div 2 =$  **\$3.58**
9.  $\$2.16 \div 9 =$  **\$0.24**
10.  $\$8.96 \div 8 =$  **\$1.12**

Solve each problem.

11. 5 jars of applesauce cost \$1.95. How much does each jar cost?  
**\$0.39 per jar**
12. A large box has 6 packets of graham crackers. It costs \$2.28. How much is each packet worth?  
**\$0.38 per package**



## Reteaching 94

Name \_\_\_\_\_

R94

### Way Out Fruit Stand

|         |              |            |              |
|---------|--------------|------------|--------------|
| Apples  | 8 for \$2.48 | Bananas    | 9 for \$1.08 |
| Oranges | 6 for \$1.98 | Coconuts   | 5 for \$6.35 |
| Lemons  | 3 for \$0.57 | Pineapples | 4 for \$7.28 |
| Limes   | 3 for \$0.87 | Mangos     | 2 for \$1.94 |

Fruit grows better on Earth



Find the cost of each item.  
Write each answer as dollars and cents.

1. Lemon  $3 \overline{)5.7}$  \$ **1.90**
2. Lime  $3 \overline{)8.7}$  \$ **2.90**
3. Coconut  $5 \overline{)6.35}$  \$ **1.27**
4. Pineapple  $4 \overline{)7.28}$  \$ **1.82**
5. Apple  $8 \overline{)2.48}$  \$ **0.31**
6. Orange  $6 \overline{)1.98}$  \$ **0.33**
7. Mango  $2 \overline{)1.94}$  \$ **0.97**
8. Banana  $9 \overline{)1.08}$  \$ **0.12**



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1-11 |
| average  | 1-12 |
| enriched | 1-14 |

**More Practice Set 94,**  
page 385

## Follow-Up

**Extra Practice** *Use data from outside the text* Ask students to bring in advertisements for food items (cut from newspapers) showing items that sell two or three for a certain price. Have students divide to find the cost per item. Be aware that some sale prices will not divide evenly, like 3 for \$1.00. Explain that if there is a remainder when the students divide, the cost of a single item (quotient) will be increased by one cent. For example:  $\$1.00 \div 3$  [ $\$0.33$  R1  $\rightarrow$   $\$0.34$ ]

**Reteaching** *Using Concrete Materials* Have students do the exercises using play money.

**Enrichment** *Write a problem* Have students write problems like Problem 14 using their favorite foods. Discuss the concept of unit pricing.

c. Find  $\$1.56 \div 4$ .

$$\begin{array}{r} 39 \rightarrow \$0.39 \\ 4 \overline{)156} \\ \underline{12} \phantom{0} \\ 36 \\ \underline{36} \\ 0 \end{array}$$

**Try** Divide. Write each answer as dollars and cents. Explain to another student why your answers are reasonable.

- a.  $\$3.58 \div 2$  **\$1.79**    b.  $\$1.45 \div 5$  **\$0.29**    c.  $\$0.56 \div 4$  **\$0.14**    d.  $\$0.91 \div 7$  **\$0.13**  
e. Roxanne had \$1.28 in her change purse. She had 8 coins altogether. None of them were dimes. What were the coins? Use play money to help you.  
**5 quarters and 3 pennies**

**Practice** Divide. Write each answer as dollars and cents.

1.  $\$6.50 \div 5$  **\$1.30**    2.  $\$7.20 \div 6$  **\$1.20**    3.  $\$9.24 \div 3$  **\$3.08**    4.  $\$4.10 \div 2$  **\$2.05**  
5.  $\$8.96 \div 8$  **\$1.12**    6.  $\$9.17 \div 7$  **\$1.31**    7.  $\$0.75 \div 5$  **\$0.15**    8.  $\$0.60 \div 4$  **\$0.15**

**Apply** Solve each problem.

9. Soup is sold at 5 cans for \$2.15. What is the cost per can?  
**\$0.43**  
11. Three people divided a restaurant bill equally. The bill was \$8.85. Is it reasonable to say that they each paid \$5? Why or why not?  
**No; if each paid \$5, the bill would have been closer to \$15.**  
13. Brian bought 3 quarts of ice cream for \$4.77. What was the cost per quart?  
**\$1.59**  
10. Milk costs \$1.49 per gallon. What is the cost of 2 gallons?  
**\$2.98**  
12. Joe counted the change in his pockets to be 58¢. Only three coins were pennies. What is the most number of coins he could have in his pockets? What is the least number of coins possible?  
**14 coins; 5 coins. See margin.**  
14. Brand A juice sells at 6 cans for \$2.88. Brand B sells at 3 cans for \$1.47. Which brand costs more per can?  
**Brand B**



More Practice Set 94, page 385 253

## Enrichment 94

Name \_\_\_\_\_ E94

**How Many Can I Buy?**

**RUMMAGE SALE**  
Puzzles—\$0.09

You have \$1.14.  
Think of \$1.14 as 114¢.

How many puzzles can you buy? **12 R6**

How much money will be left? **6**

You can buy 12 puzzles. \$0.06 will be left.

How many can you buy? How much money will be left?

|   |  |   |
|---|--|---|
| 1. Pencils—\$0.03<br>You have \$1.37<br>How many pencils? <b>45</b><br>How much left? <b>\$0.02</b> | 2. Toy cars—\$0.09<br>You have \$0.75<br>How many cars? <b>8</b><br>How much left? <b>\$0.03</b> | 3. Rulers—\$0.08<br>You have \$1.49<br>How many rulers? <b>18</b><br>How much left? <b>\$0.05</b> |
| 4. Photos—\$0.09<br>You have \$2.41<br>How many photos? <b>26</b><br>How much left? <b>\$0.07</b>   | 5. Pens—\$0.07<br>You have \$3.52<br>How many pens? <b>50</b><br>How much left? <b>\$0.02</b>    | 6. Balls—\$0.04<br>You have \$4.37<br>How many balls? <b>109</b><br>How much left? <b>\$0.01</b>  |

## Additional Resource 94



### Math Poster II Dividing Money

From left to right, by columns, the amount of money in each stack is \$4.50, \$1.75, \$0.65, \$0.12, and \$0.80. See Answer Key for extensions.

## Daily Maintenance

Solve each problem.

1. The pet store had 30 puppies. It sold 6 poodles and 5 collies. How many puppies were left?  
[19 puppies]  
2. Monica bought 3 pencils for \$0.09 each and 4 erasers for \$0.05 each. How much did she spend in all?  
[\$0.47]  
3. Ben had 12 miniature cars. After keeping 6 for himself, he gave an equal number to his two friends. How many cars did each of his friends get?  
[3 cars]

Answers, page 253

12. Most number of coins: 14  
(3 pennies, 11 nickels)  
Least number of coins: 5  
(3 pennies, 1 nickel, 1 half dollar)



## Practice

Mixed Practice for Objectives 89–94

### Introduction

**Warm-Up Review** Use these exercises to review the objectives.

|  |  |  |
|--|--|--|
| $\begin{array}{r} 12 \text{ R1} \\ 5 \overline{)61} \end{array}$   | $\begin{array}{r} 10 \text{ R2} \\ 3 \overline{)32} \end{array}$   | $\begin{array}{r} 113 \text{ R1} \\ 8 \overline{)905} \end{array}$ |
| $\begin{array}{r} 105 \text{ R3} \\ 9 \overline{)948} \end{array}$ | $\begin{array}{r} 200 \text{ R3} \\ 4 \overline{)803} \end{array}$ | $\begin{array}{r} 9 \text{ R6} \\ 9 \overline{)87} \end{array}$    |
| $\begin{array}{r} 95 \\ 6 \overline{)570} \end{array}$             | $\begin{array}{r} 50 \text{ R2} \\ 7 \overline{)352} \end{array}$  |  |

### Using the Pages

**Practice Estimation** Encourage students to estimate quotients before they compute, and then compare their estimate with their exact answer after they compute to see if their exact answer is reasonable.

**Error Analysis** Watch for students who may be having trouble with zeros (Exercises 11, 15, 16, 23, 24, 29). Remind these students that each time they bring down a digit and divide, they must write a digit in the quotient. Sometimes that digit is zero.

**Error Analysis** Watch for students who are not placing the digits correctly in the quotient (Exercises 19–22, 26, 27, 29). Have these students tell the number of digits they expect in the quotient before they divide. In Exercises 33–40, have students tell what is wrong in the exercises that are incorrect. [In Exercise 34, the remainder of 1 was put in the ones place instead of zero. In Exercise 35, 9 was put in the tens place instead of the ones place. In Exercise 37, 1 should have been written in the hundreds place with 0 in the tens place. In Exercise 40, 5 should be the digit in the ones place, not the remainder.]

### Apply Problem Solving

**Choosing a computation method** Allow students to work in small groups to discuss and solve each problem.

**Choose the operation** Problems 41 and 43 involve division. Problem 44 involves subtraction. Problem 45 is a multiple-step problem involving multiplication, addition, and division.

**Calculator** Problem 46 involves division. Have students estimate their answer before calculating.

(Continued on page 255.)

## Practice: Division

Be smart.  
Estimate when  
you calculate.



Divide.

|  |  |  |  |  |
|--|--|--|--|--|
| $\begin{array}{r} 28 \\ 3 \overline{)84} \end{array}$              | $\begin{array}{r} 15 \\ 6 \overline{)90} \end{array}$              | $\begin{array}{r} 32 \text{ R1} \\ 2 \overline{)65} \end{array}$   | $\begin{array}{r} 15 \text{ R2} \\ 5 \overline{)77} \end{array}$   | $\begin{array}{r} 20 \text{ R3} \\ 4 \overline{)83} \end{array}$   |
| $\begin{array}{r} 10 \text{ R5} \\ 7 \overline{)75} \end{array}$   | $\begin{array}{r} 21 \text{ R1} \\ 2 \overline{)43} \end{array}$   | $\begin{array}{r} 25 \text{ R2} \\ 3 \overline{)77} \end{array}$   | $\begin{array}{r} 13 \text{ R3} \\ 7 \overline{)94} \end{array}$   | $\begin{array}{r} 16 \text{ R3} \\ 4 \overline{)67} \end{array}$   |
| $\begin{array}{r} 10 \text{ R5} \\ 8 \overline{)85} \end{array}$   | $\begin{array}{r} 31 \\ 3 \overline{)93} \end{array}$              | $\begin{array}{r} 126 \\ 6 \overline{)756} \end{array}$            | $\begin{array}{r} 185 \text{ R2} \\ 5 \overline{)927} \end{array}$ | $\begin{array}{r} 100 \text{ R5} \\ 8 \overline{)805} \end{array}$ |
| $\begin{array}{r} 207 \text{ R1} \\ 3 \overline{)622} \end{array}$ | $\begin{array}{r} 117 \text{ R1} \\ 7 \overline{)820} \end{array}$ | $\begin{array}{r} 188 \text{ R2} \\ 4 \overline{)754} \end{array}$ | $\begin{array}{r} 43 \\ 9 \overline{)387} \end{array}$             | $\begin{array}{r} 31 \text{ R3} \\ 6 \overline{)189} \end{array}$  |

|                     |                     |                     |                     |
|---------------------|---------------------|---------------------|---------------------|
| 21. $562 \div 8$    | 22. $389 \div 7$    | 23. $600 \div 5$    | 24. $480 \div 3$    |
| $70 \text{ R2}$     | $55 \text{ R4}$     | $120$               | $160$               |
| 25. $910 \div 6$    | 26. $463 \div 9$    | 27. $393 \div 6$    | 28. $973 \div 5$    |
| $151 \text{ R4}$    | $51 \text{ R4}$     | $65 \text{ R3}$     | $194 \text{ R3}$    |
| 29. $\$2.80 \div 4$ | 30. $\$7.86 \div 2$ | 31. $\$9.48 \div 6$ | 32. $\$0.92 \div 4$ |
| $\$0.70$            | $\$3.93$            | $\$1.58$            | $\$0.23$            |

Check each division. If the answer is wrong, give the correct answer.

|   |  |  |   |
|---|--|--|---|
| $\begin{array}{r} 19 \\ 5 \overline{)95} \end{array}$             | $\begin{array}{r} 31 \\ 2 \overline{)61} \end{array}$              | $\begin{array}{r} 90 \text{ R1} \\ 8 \overline{)73} \end{array}$ | $\begin{array}{r} 14 \text{ R1} \\ 6 \overline{)85} \end{array}$  |
| <b>Correct</b>  | $30 \text{ R1}$  | $9 \text{ R1}$   | <b>Correct</b>  |
| $\begin{array}{r} 11 \text{ R4} \\ 8 \overline{)812} \end{array}$ | $\begin{array}{r} 200 \text{ R1} \\ 3 \overline{)601} \end{array}$ | $\begin{array}{r} 76 \\ 7 \overline{)532} \end{array}$           | $\begin{array}{r} 40 \text{ R5} \\ 9 \overline{)405} \end{array}$ |
| $101 \text{ R4}$  | <b>Correct</b>   | <b>Correct</b>   | $45$  |

**Apply Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve Problems 41–46. Tell which method you used.

- |   |   |
|---|---|
| 41. Carl bought 3 notebooks for \$4.47. All the notebooks cost the same. How much was each?<br>$\$1.49$ ; P, C  | 42. Juan has 4 shelves with 20 toy cars on each. How many toy cars are on the shelves?<br>$80 \text{ cars}$ ; M   |
| 43. An auditorium had 624 seats in 3 equal sections. How many seats were in each section?<br>$208 \text{ seats}$ ; P, C   | 44. Lucy has film for 12 pictures. She has taken 8 pictures. How many pictures are left to take?<br>$4 \text{ pictures}$ ; M  |
| 45. Roberto and his brother bought 3 birthday cards that cost \$0.90 each. They also bought a gift that cost \$4.50. They split the total cost equally. How much did each boy pay?<br>$\$3.60$ ; P, C | 46. Joan bought extra pages for her photo album. Each package of pages costs \$3.79. She spent \$18.95. How many packages of pages did she buy?<br>$5 \text{ packages}$ ; C |

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## Practice Game

### Spin and Divide

**Number of players:** 2–4

**Materials:** Different marker for each player, spinner, and game board

On a large piece of tagboard, draw a game board similar to the one shown. However, the path from Start to Finish can be made in any shape. You can make a spinner from a circular piece of tagboard with a paper clip fastened to the center. Mark the spinner with the numbers you want to use as divisors. Mark the game board with the numbers you want to use as dividends.

### Rules

- On the first turn, each player spins the spinner and divides the number in the Start space by the number on the spinner.
- The player then moves ahead the same number of spaces as the remainder after dividing. If there is no remainder, the player does not move.
- In each turn after the first, a player divides the number in the space his or her marker is on by the number that was spun, and then he or she moves as before.

**The Winner:** The first player to reach Finish is the winner.



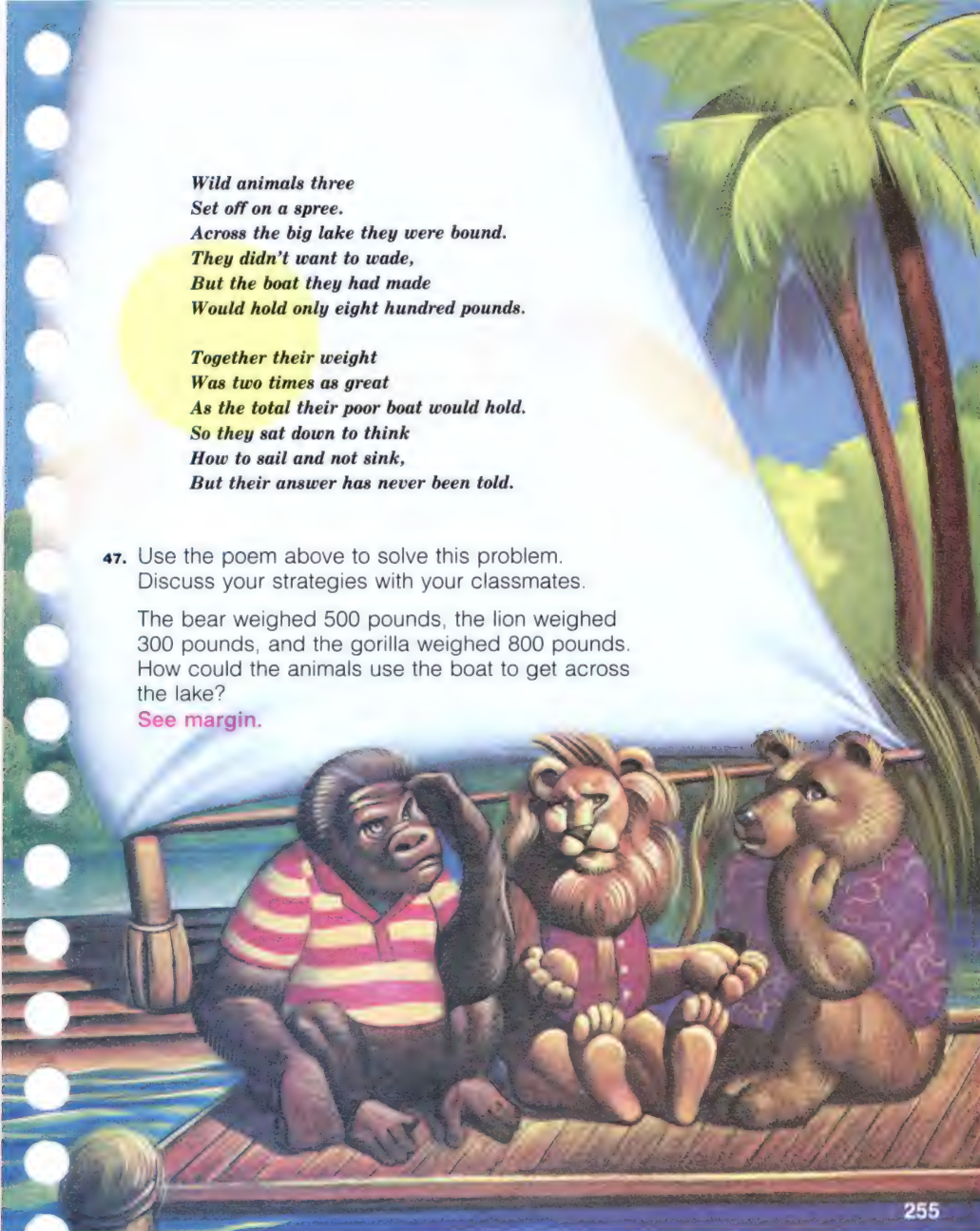
Wild animals three  
Set off on a spree.  
Across the big lake they were bound.  
They didn't want to wade,  
But the boat they had made  
Would hold only eight hundred pounds.

Together their weight  
Was two times as great  
As the total their poor boat would hold.  
So they sat down to think  
How to sail and not sink,  
But their answer has never been told.

47. Use the poem above to solve this problem.  
Discuss your strategies with your classmates.

The bear weighed 500 pounds, the lion weighed 300 pounds, and the gorilla weighed 800 pounds.  
How could the animals use the boat to get across the lake?

See margin.



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## Assignment Guide

basic 1–15, 29–44, 47  
average 1–24, 29–43 odd, 46–47  
enriched 1–40 odd or even, 41–47

(Continued from page 254.)

**Draw a picture** For Problem 47, read the poem with the students. It might be helpful if they draw a lake, mark three pieces of paper with the weights of the animals, and make the boat from another piece of paper. In this way they can experiment moving the papers back and forth across the lake. Encourage students to find various solutions.

## Follow-Up

Have students play the game that is described below the lesson pages.

## Calculator

Show students how to check their answers to division exercises using a calculator. For example, to check  $785 \div 4 = 196 \text{ R}1$ , they should use the following key sequence.

4  $\times$  196  $\div$  1  $=$  785

## Reading and Writing Mathematics

To review vocabulary, have students look up these words in the glossary and write the meaning of each: dividend [a number that is divided by another number], divisor [a number that divides another number], quotient [the answer to a division problem].

## Daily Maintenance

- $52 \times 365$  [18,980]
- $31 \times 863$  [26,753]
- $67 \times 142$  [9,514]
- $48 \times 475$  [22,800]
- $13 \times 729$  [9,477]

## Answers, page 255

47. The solution with the least number of trips across the lake [5] is as follows:  
First trip: the bear and lion cross together. Second trip: one animal stays and the other crosses back alone. Third trip: the gorilla crosses back alone. Fourth trip: the bear or the lion crosses back alone. Fifth trip: the lion and bear cross the lake again.

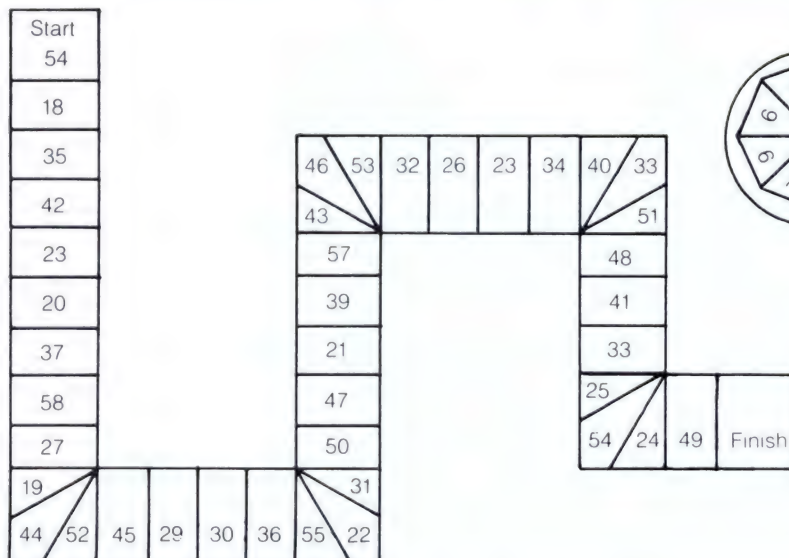
→ bear and lion

← lion or bear

→ gorilla

← bear or lion

→ bear and lion





## Objective 95

Solve problems by interpreting remainders.

### Lesson Theme

School Activities: Class Play

### Materials

- Common objects

## Introduction

**Motivational Situation** Pose the following problem to the students. Suppose our class wanted to put on a play for the school. What types of things would we need to do? [Get a play, select actors, practice, make costumes and scenery, get props, determine how many performances, determine the place and time of the performance.]

## Using the Pages

**Teach** Emphasize that answering a problem correctly often involves more than just computing properly. Students must focus on what information is needed. Work through each step of the example with the students. Extend the example with these problems:

1. If 3 feathers are needed on each hat and the students have 35 feathers, how many hats can they make? [11]
2. The students have 35 feathers. If they make as many hats as they can with 3 feathers on each hat, how many feathers will be left over? [2]

**Try** Remind students to reread each problem after they have finished computing to see if they have answered the question that was asked.

**Apply Problem Solving** Encourage students to estimate what an answer will be before computing. Remind students that two answers are needed for Problem 3.

**Write a problem** Have students work in groups. Give each group a division exercise such as  $137 \div 5$ . Have each group write three problems; one in which the remainder provides the information needed; one in which the quotient needs to be increased by one to get a correct answer; and one in which the quotient without the remainder is sufficient to answer the question.

### Problem Solving

### Interpreting Remainders

When you use division to solve a problem, you may need to decide what the remainder means.

Mrs. Ching's class is making hats for a class play. They need 35 colored feathers. The feathers come in packages of 3 each. How many packages do they need to buy?

**Read** Facts: 35 feathers needed, 3 in each package  
Find: Number of packages to buy

**Plan** Think of 35 separated into equal groups with 3 in each group. Use division. Find  $35 \div 3$ .

**Solve**

$$\begin{array}{r} 11 \text{ R}2 \\ 3 \overline{)35} \\ \underline{3} \phantom{0} \\ 05 \\ \underline{3} \phantom{0} \\ 2 \end{array}$$

Estimate using compatible numbers:  
 $30 \div 3 = 10$

**Answer** They need 11 packages plus 2 more feathers. To get 2 more feathers, they must buy 1 more package.  $11 + 1 = 12$   
The class needs to buy 12 packages of feathers.

**Look Back** Since 35 feathers are needed and  $11 \times 3 = 33$ , 11 packages would not be enough. Since  $12 \times 3 = 36$ , 12 packages would be enough.

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## Practice 95

Name \_\_\_\_\_ P95

Solve each problem.

1. Joe builds model cars. If he can put 6 cars on a shelf, how many shelves will he need for 20 cars?  
3 shelves
2. Joe can build 3 model cars in a month. How many months will it take him to build 10 model cars?  
4 months
3. Kari's stamp album holds 160 stamps. It has 8 pages. Each page can hold the same number of stamps. How many stamps can she put on each page?  
20 stamps
4. Kari has 80 cents to spend for new stamps. How many 7-cent stamps can she buy?  
11 stamps
5. Jamie collected 134 stickers. Each page of her album will hold 9 stickers. How many pages can she fill?  
14 pages
6. Jamie has 47 animal stickers. If she puts 8 stickers on each page of her album, how many stickers will be left over?  
7 stickers left
7. Chuck found 170 seashells. If he puts 7 shells into each bag, how many bags will he need for all the shells?  
25 bags
8. How many groups of 5 shells each can Betty make with 89 shells?  
17 groups

## Reteaching 95

Name \_\_\_\_\_ R95

The Oceanview Aquarium has 34 tropical fish. If each tank holds only 5 fish, then how many tanks are needed?

6 R4  
$$\begin{array}{r} 6 \text{ R}4 \\ 5 \overline{)34} \\ \underline{30} \phantom{0} \\ 4 \end{array}$$

What about us? That's better.  
You need 7 tanks.

Solve each problem.

1. Joe has 41 fish. If he feeds all 12 porpoises the same number of fish, how many fish will be left over?  
3 R5  
$$\begin{array}{r} 3 \text{ R}5 \\ 12 \overline{)41} \end{array}$$
5 fish
2. Only 3 eels will fit in each tank. How many tanks are needed for 13 eels?  
4 R1  
$$\begin{array}{r} 4 \text{ R}1 \\ 3 \overline{)13} \end{array}$$
5 tanks
3. The racing turtle takes 8 minutes to swim across a tank. How many of these trips could the turtle make in 1 hour?  
7 R4  
$$\begin{array}{r} 7 \text{ R}4 \\ 8 \overline{)60} \end{array}$$
7 trips
4. At lunchtime, 30 students sat in groups of 4. How many groups of 4 were there?  
7 R2  
$$\begin{array}{r} 7 \text{ R}2 \\ 4 \overline{)30} \end{array}$$
7 groups
5. Each shark guide can take only 8 children to see the sharks. How many guides are needed for 30 students?  
3 R6  
$$\begin{array}{r} 3 \text{ R}6 \\ 8 \overline{)30} \end{array}$$
4 guides
6. The porpoise show lasts 20 minutes. How many shows can be given in 90 minutes?  
4 R10  
$$\begin{array}{r} 4 \text{ R}10 \\ 20 \overline{)90} \end{array}$$
4 shows



**More Practice Set 95,  
page 386**

### **Reteaching** *Using Concrete Materials*

**Enrichment** *Write a problem* Have students write their own problems about school plays.

In each exercise, the items cost the same amount. Find the cost of one item.

- Find the cost of one liter or kilogram of each item.

- 9 kilograms of onions: \$7.38  
[\$0.82]
- 5 kilograms of apples: \$9.85  
[\$1.97]
- 8 liters of house paint: \$28.88  
[\$3.61]
- 6 liters of antifreeze: \$6.90  
[\$1.15]
- 3 kilograms of cheese: \$15.78  
[\$5.26]

**Mental Math** Have students do these exercises mentally.

1.  $18 \div 6$  [3]
2.  $48 \div 8$  [6]
3.  $28 \div 4$  [7]
4.  $40 \div 8$  [5]
5.  $36 \div 9$  [4]

### Enrichment 95


Name \_\_\_\_\_

## Division Sentences

**E95**

Fill in the blanks to make these division sentences all true

|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 1 | 6 | ÷ | 9 | = | 7 | 9 | R | 5 |
| 3 |   | 2 |   |   |   |   |   | 4 |   |
| ÷ |   | ÷ |   |   |   |   |   | ÷ |   |
| ÷ |   | 3 | 8 | ÷ | 5 | = | 7 | R | 3 |
| = |   | = |   |   |   |   |   | = |   |
| 1 |   | 2 |   |   |   |   |   | 1 |   |
| 8 |   | 0 |   |   |   |   |   |   |   |
| R |   | R |   | 3 |   |   |   |   |   |
| 1 |   | 5 |   |   |   |   |   |   |   |
|   | 2 | 4 | 3 | ÷ | 6 | = | 4 | 0 | R |
|   |   | ÷ |   |   |   |   |   |   | 3 |
|   |   | 6 |   |   |   |   |   |   | 2 |
|   |   | = |   |   |   |   |   |   | 9 |
|   |   | 5 |   |   |   |   |   |   | 1 |
|   |   | 8 |   |   |   |   |   |   | 8 |
|   |   | R |   |   |   |   |   |   | R |
|   | 2 | 7 | 5 | ÷ | 6 | = | 4 | 5 | R |
|   |   |   |   |   |   |   |   |   | 5 |
|   |   |   |   |   |   |   |   |   | R |
|   |   |   |   |   |   |   |   |   | 6 |



| Name _____  |                     | Additional Resource |
|---|---------------------|---------------------|
| <b>Project    Name a Number</b>   |                     | <b>95</b>           |
| <p>Can you give a multiplication sentence and a division sentence to name the number 324? Here is one way:</p> <p><math>81 \times 4 = 324</math>      <math>648 \div 2 = 324</math></p> |                     |                     |
| <p>Complete the table. Give a multiplication sentence and a division sentence for each number.</p> <p><i>(Multiplication and Division sentences are equal.)</i></p>                     |                     |                     |
| Number  | Multiplication      | Division            |
| 76  | $4 \times 19 = 76$  | $152 \div 2 = 76$   |
| 87  | $3 \times 29 = 87$  | $261 \div 3 = 87$   |
| 95  | $5 \times 19 = 95$  | $380 \div 4 = 95$   |
| 246   | $3 \times 82 = 246$ | $738 \div 3 = 246$  |
| 427   | $7 \times 61 = 427$ | $854 \div 2 = 427$  |
| 387   | $9 \times 43 = 387$ | $774 \div 2 = 387$  |
| 408   | $8 \times 51 = 408$ | $816 \div 2 = 408$  |
| 192   | $32 \times 6 = 192$ | $768 \div 4 = 192$  |



## Objective 96

Find averages.

### Lesson Theme

School Activities: Class Play

### Vocabulary

Average

### Materials

- Money (Punchouts)
- Hundreds, Tens, Units (Punchouts or Math Kit)
- Egg carton
- Beans

## Introduction

**Using Concrete Materials** Using play money, give the first of four students 6 pennies; the second, 4 pennies; the third, 3 pennies; and the fourth, 7 pennies. Ask, "If each student had the same number of pennies, how many pennies would each student have?" Have the students put all the pennies together (add) [20], and then make 4 groups (divide) to find the answer. [5] Point out to students that 5 is the average number of pennies even though none of the four students was given exactly 5 pennies.

## Using the Pages

**Teach** Students should understand that an act in a play is one of several short sections of the play. Point out that students are illustrating the meaning of *average* in the example by showing that 36 (the total time of the play) divided by 4 (the number of acts) gives 9 (the average time of each act).

**Try** Ask students by what number they should divide in each exercise.

**Practice Using Concrete Materials** In Exercise 5, students may be confused by the zero in the set of numbers to be averaged. Although the zero in the set adds nothing to their total of counters, students must still show 9 equal groups of counters. Another example: 8, 6, 8, 0, 4, 10. [6] In Exercises 6 and 7, students should recognize that they can add the numbers in the set, and divide by the number of numbers in the set to find the average. For Exercise 7, allow time for students to use concrete materials in their groups and to discover the algorithm for finding an average.

**Error Analysis** For Exercises 8–11, watch for students who forget to add one or more numbers in the groups, have an incorrect sum, or use an incorrect divisor. Have these students check their work for these errors and make the needed corrections. (See **Reteaching 96**.)

(Continued on page 259.)

## Finding Averages

The 4 acts in the school play lasted 8 minutes, 10 minutes, 12 minutes, and 6 minutes. Suppose each act had lasted the same number of minutes. That number is the same as the **average** length of an act.

Use your counters and work in groups of 4. Each of you take enough counters to represent the number of minutes in one of the acts.

Put the counters together in one group. How many counters are in the group? How did you find the total number?

Now divide the counters so that each person has the same number. How many counters does each of you have?

What is the average length of an act?

**Try** Use your counters to find the average of each set of numbers.

a. 2, 6, 9, 3

b. 9, 7, 2

**Practice** Work in groups and use your counters to find the average of each set of numbers.

1. 1, 4, 7

2. 11, 9

3. 8, 12, 9, 3

4. 3, 8, 2, 5, 7

5. 3, 8, 2, 5, 1, 6, 3, 8, 0

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## Practice 96

Name: \_\_\_\_\_

Find the average of each group of numbers. **P96**

1. 15, 35, 25 25 2. 6, 11, 14, 13, 56 20 3. 104, 97, 27, 0 57

4. 104, 97, 27 76 5. 298, 304, 416, 187, 195 280 6. 16, 16, 16, 16 16

Solve each problem.

7. The Bucks made 200 field goals in 9 basketball games. What was the average number of field goals they made in each game? 25 field goals

8. Allison made 4 necklaces with 39, 102, 97, and 103 beads on them. What was the average number of beads on each necklace? 100 beads

9. During 5 days, Brian practiced the piano for 35, 40, 55, 30, and 65 minutes. What was the average number of minutes he practiced each day? 45 minutes

10. A kennel spent \$400 for a one-month supply of dog food. 25 dogs were fed. What was the average cost of feeding each dog? \$16 per dog

## Reteaching 96

Name: \_\_\_\_\_

Find the average of 12, 28, 14, and 42. **R96**

Find the sum. Count the numbers. Divide 96 by 4.

12  
28  
14  
+ 42  
96

1, 2, 3, 4

24  
4196  
8  
16  
16  
0  
The average is 24.

Complete the table.

|                      | 1 | 5  | 12 | 120 | 2  | 21 |
|----------------------|---|----|----|-----|----|----|
| 3                    | 2 | 10 | 15 | 200 | 3  | 23 |
| 5                    | 3 | 15 | 21 | 430 | 4  | 24 |
|                      |   |    |    |     | 7  | 28 |
| What is the sum?     | 6 | 30 | 48 | 750 | 16 | 96 |
| How many numbers?    | 2 | 3  | 3  | 3   | 4  | 4  |
| What is the average? | 2 | 10 | 16 | 250 | 4  | 24 |



6. Use these steps to find the average of 65, 67, and 72.

**Step 1** Imagine putting this many counters together. How can you find the total number without counting?

**Step 2** Now imagine dividing the total number into 3 equal groups. How can you find the number in each group? What is the average?

7. With other students, discuss a method for finding the average of a set of numbers. Without using counters, test your method on some of the exercises on page 258.

Find the average.

8. 17, 24, 19      9. 36, 48, 15, 13

10. 129, 132, 118, 100, 121, 42

11. 198, 204, 216, 187, 195

12. **CALCULATOR** Work in groups. Discuss how you can use a calculator to find an average. Then test your method on Exercises 10 and 11.

**Apply** Solve each problem.

13. Karen said that the average age of the students in her elementary school was 18. Was this reasonable? Explain why or why not.

14. Without computing, what do you think might be an average for this set of numbers?

5, 12, 17, 84, 88, 100

Explain your thinking to another student. Then compute the average.

15. **CALCULATOR** In the last 2 plays, there were a total of 49 people involved. Use your calculator to find the average number of people in each play. Could your answer be the actual number in each play? Explain your answer.

More Practice Set 96, page 386 259

## Assignment Guide

|          |            |
|----------|------------|
| basic    | 1–14       |
| average  | 1–15       |
| enriched | 1–7, 10–15 |

**More Practice Set 96,**  
page 386

(Continued from page 258.)

**Calculator** Encourage students to write their sequences.

**Apply Problem Solving** Problem 13 involves imagining numbers to be averaged. Problem 14 involves analyzing numbers to be averaged. Encourage students to look at the size and amount of numbers to be averaged to help them determine if their answers are reasonable. Problem 15 has students consider an average that cannot physically exist, but is nonetheless the average for the set.

## Follow-Up

**Extra Practice Using Concrete Materials**

Use an egg carton and beans to make a game for finding averages. Cut off the top of the egg carton and mark the inside of each egg cup with a number from 1 through 12. Place the carton on the floor. Have each student toss 5 beans into the egg cups. The student then adds the score as determined by the cups in which the beans landed and finds the average. If there is a remainder after dividing, drop the remainder and use the rest of the quotient as a score. The student with the highest score wins.

## Enrichment 96

Name \_\_\_\_\_ E96

**Averages in Experiments**

Make 4 cards for each of the numbers 1–30

1 2 3 4 5 6 7 8 9 30

1 2 3 4 5 6 7 8 9 30

1 2 3 4 5 6 7 8 9 30

1 2 3 4 5 6 7 8 9 30

Mix the cards. Place them face down. Draw cards as indicated in each exercise. Record the number of cards that you drew. Replace the cards and repeat the experiment. Find the average number of cards drawn. Ignore any remainder.

1. Draw cards until you get a 5

| Trial                 | 1 | 2 | 3 | 4 | 5 | 6 | Total |
|-----------------------|---|---|---|---|---|---|-------|
| Number of cards drawn |   |   |   |   |   |   |       |

Average number of cards drawn to get a 5: Answers will vary.

2. Draw cards until you get a match

| Trial                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
|-----------------------|---|---|---|---|---|---|---|---|-------|
| Number of cards drawn |   |   |   |   |   |   |   |   |       |

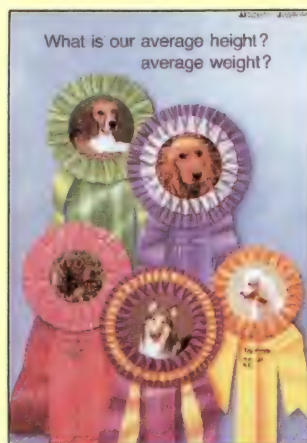
Average number of cards drawn to get a match: Answers will vary.

3. Draw cards until you get two 6s

| Trial                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|-----------------------|---|---|---|---|---|---|---|-------|
| Number of cards drawn |   |   |   |   |   |   |   |       |

Average number of cards drawn to get two 6s: Answers will vary.

## Additional Resource 96



### Math Poster JJ Finding Averages

The average height is 18 inches. The average weight is 38 pounds. See Answer Key for enrichment activities to use with this poster.

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

- |                      |                       |
|----------------------|-----------------------|
| 1. $8 \times 2$ [16] | 2. $9 \times 6$ [54]  |
| 3. $7 \times 3$ [21] | 4. $3 \times 9$ [27]  |
| 5. $8 \times 5$ [40] | 6. $6 \times 6$ [36]  |
| 7. $1 \times 3$ [3]  | 8. $7 \times 4$ [28]  |
| 9. $0 \times 6$ [0]  | 10. $8 \times 9$ [72] |

Answers, pages 258–259

**Example:**

There are 36 counters in the group. To find the total number, add or count. Each has 9 counters. 9 minutes

a. 5 b. 6

1. 4 2. 10 3. 8 4. 5 5. 4

6. Step 1: Add them.

Step 2: Divide by 3; 68

Answers are continued on page 273 of this Teacher's Edition.



## Objective 97

Divide a two- or three-digit number by a multiple of 10 to get a one-digit quotient.

### Lesson Theme

School Activities: Amusement Park

### Materials

- Hundreds, Tens, Units (Punchouts or Math Kit)

### Introduction

**Warm-Up Review** Write the following on the board:  $6 \times 7 = 42$ ,  $60 \times 7 = 420$ . Review the pattern used when multiplying with multiples of 10 (pages 148–149). Other examples:

$$4 \times 8 [32], \quad 40 \times 8 [320]$$

$$7 \times 8 [56], \quad 70 \times 8 [560]$$

$$6 \times 6 [36], \quad 60 \times 6 [360]$$

## Using the Pages

**Teach Using Concrete Materials** As students work in their groups on Example A, help students to see that they need to find how many 20s are in 150. Therefore, they can model 150 as 15 tens. Example B can be computed similarly. In Example C, students should recognize that there are four 90s in 360, since there are four 9s in 36.

**Practice** After students use their place-value materials to divide by multiples of ten (Exercises 1–24), they continue to use them to divide by other two-digit numbers (Exercises 25–30). In the next lesson, students will record their work using an algorithm. For Exercise 25, students can rename 1 hundred, 4 tens, and 4 ones, as 144 ones and separate them into groups of 48 ones, or they can rename 144 as tens and ones and separate them into groups of 48. For Exercises 25–30, ask students to estimate using compatible numbers.

**Apply Problem Solving** In Problem 31, students divide by a multiple of ten. In Problem 32, the divisor is a two-digit number other than a multiple of ten.

## Multiples of 10 as Divisors

See *Using the Pages* for a discussion of these examples.

- A.** Jill has 150 boxes of T-shirts to distribute to 20 shops throughout Funland Amusement Park. If she gives each shop the same number of boxes, how many will each shop get? How many boxes will be left over?

Work with 3 other students. Use your place-value materials to find  $150 \div 20$ . Try to do the work without using 150 ones.

Explain your method to other students. If they did the work differently, discuss both methods.

How many boxes of T-shirts will each shop get? How many boxes will be left over?

**7 boxes; 10 boxes left over**

- B.** Find  $271 \div 30$ . **9 R1**

Use place-value materials to find the answer. Explain your method to another student.

- C.** Find  $360 \div 90$  mentally. **4**

Discuss with other students how you can use the basic fact  $36 \div 9$  to find this answer mentally.

### Try

Work in groups. Use place-value materials to divide.

- a.**  $40 \overline{)241}$  **6 R1**    **b.**  $60 \overline{)190}$  **3 R10**    **c.**  $526 \div 80$  **6 R46**

Divide mentally. Explain orally which basic fact you used to help.

- d.**  $40 \overline{)280}$  **7**    **e.**  $20 \overline{)120}$  **6**    **f.**  $50 \overline{)300}$  **6**



Use Practice 97, Reteaching 97, Enrichment 97, and Additional Resource 97 after pages 262–263. See note at the top of page 261.

## Practice 97

Why can't the Cavemen play baseball in the daylight?

To find out, divide. Each time an answer is given in the code, write the word for that exercise below. Several answers are not used.

**Exercise 1:**  $30 \overline{)270}$  **DONT**    **Exercise 2:**  $50 \overline{)350}$  **LIGHT**    **Exercise 3:**  $20 \overline{)136}$  **SETS**

**Exercise 4:**  $90 \overline{)389}$  **THE**    **Exercise 5:**  $40 \overline{)333}$  **ONLY**    **Exercise 6:**  $80 \overline{)296}$  **BATS**

**Exercise 7:**  $70 \overline{)172}$  **SO**    **Exercise 8:**  $30 \overline{)207}$  **SEE**    **Exercise 9:**  $60 \overline{)300}$  **COME**

**Exercise 10:**  $20 \overline{)109}$  **UNTIL**    **Exercise 11:**  $90 \overline{)765}$  **THE**    **Exercise 12:**  $40 \overline{)149}$  **THEY**

**Exercise 13:**  $80 \overline{)143}$  **CANT**    **Exercise 14:**  $50 \overline{)443}$  **NIGHT**    **Exercise 15:**  $70 \overline{)647}$  **OUT**

**Exercise 16:**  $90 \overline{)491}$  **BALL**    **Exercise 17:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 18:**  $80 \overline{)597}$  **SUN**

**Exercise 19:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 20:**  $60 \overline{)190}$  **3 R10**    **Exercise 21:**  $50 \overline{)300}$  **6**

**Exercise 22:**  $40 \overline{)382}$  **3 R2**    **Exercise 23:**  $30 \overline{)207}$  **SEE**    **Exercise 24:**  $20 \overline{)136}$  **SETS**

**Exercise 25:**  $40 \overline{)280}$  **7**    **Exercise 26:**  $30 \overline{)241}$  **6 R1**    **Exercise 27:**  $50 \overline{)300}$  **6**

**Exercise 28:**  $60 \overline{)190}$  **3 R10**    **Exercise 29:**  $80 \overline{)296}$  **BATS**    **Exercise 30:**  $90 \overline{)765}$  **THE**

**Exercise 31:**  $20 \overline{)109}$  **UNTIL**    **Exercise 32:**  $40 \overline{)149}$  **THEY**    **Exercise 33:**  $70 \overline{)647}$  **OUT**

**Exercise 34:**  $80 \overline{)143}$  **CANT**    **Exercise 35:**  $50 \overline{)443}$  **NIGHT**    **Exercise 36:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 37:**  $90 \overline{)597}$  **SUN**    **Exercise 38:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 39:**  $60 \overline{)190}$  **3 R10**

**Exercise 40:**  $50 \overline{)300}$  **6**    **Exercise 41:**  $40 \overline{)280}$  **7**    **Exercise 42:**  $30 \overline{)241}$  **6 R1**

**Exercise 43:**  $80 \overline{)296}$  **BATS**    **Exercise 44:**  $90 \overline{)765}$  **THE**    **Exercise 45:**  $20 \overline{)136}$  **SETS**

**Exercise 46:**  $70 \overline{)647}$  **OUT**    **Exercise 47:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 48:**  $80 \overline{)597}$  **SUN**

**Exercise 49:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 50:**  $60 \overline{)190}$  **3 R10**    **Exercise 51:**  $50 \overline{)300}$  **6**

**Exercise 52:**  $40 \overline{)280}$  **7**    **Exercise 53:**  $30 \overline{)241}$  **6 R1**    **Exercise 54:**  $80 \overline{)296}$  **BATS**

**Exercise 55:**  $90 \overline{)765}$  **THE**    **Exercise 56:**  $20 \overline{)136}$  **SETS**    **Exercise 57:**  $70 \overline{)647}$  **OUT**

**Exercise 58:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 59:**  $80 \overline{)597}$  **SUN**    **Exercise 60:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 61:**  $60 \overline{)190}$  **3 R10**    **Exercise 62:**  $50 \overline{)300}$  **6**    **Exercise 63:**  $40 \overline{)280}$  **7**

**Exercise 64:**  $30 \overline{)241}$  **6 R1**    **Exercise 65:**  $80 \overline{)296}$  **BATS**    **Exercise 66:**  $90 \overline{)765}$  **THE**

**Exercise 67:**  $20 \overline{)136}$  **SETS**    **Exercise 68:**  $70 \overline{)647}$  **OUT**    **Exercise 69:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 70:**  $80 \overline{)597}$  **SUN**    **Exercise 71:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 72:**  $60 \overline{)190}$  **3 R10**

**Exercise 73:**  $50 \overline{)300}$  **6**    **Exercise 74:**  $40 \overline{)280}$  **7**    **Exercise 75:**  $30 \overline{)241}$  **6 R1**

**Exercise 76:**  $80 \overline{)296}$  **BATS**    **Exercise 77:**  $90 \overline{)765}$  **THE**    **Exercise 78:**  $20 \overline{)136}$  **SETS**

**Exercise 79:**  $70 \overline{)647}$  **OUT**    **Exercise 80:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 81:**  $80 \overline{)597}$  **SUN**

**Exercise 82:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 83:**  $60 \overline{)190}$  **3 R10**    **Exercise 84:**  $50 \overline{)300}$  **6**

**Exercise 85:**  $40 \overline{)280}$  **7**    **Exercise 86:**  $30 \overline{)241}$  **6 R1**    **Exercise 87:**  $80 \overline{)296}$  **BATS**

**Exercise 88:**  $90 \overline{)765}$  **THE**    **Exercise 89:**  $20 \overline{)136}$  **SETS**    **Exercise 90:**  $70 \overline{)647}$  **OUT**

**Exercise 91:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 92:**  $80 \overline{)597}$  **SUN**    **Exercise 93:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 94:**  $60 \overline{)190}$  **3 R10**    **Exercise 95:**  $50 \overline{)300}$  **6**    **Exercise 96:**  $40 \overline{)280}$  **7**

**Exercise 97:**  $30 \overline{)241}$  **6 R1**    **Exercise 98:**  $80 \overline{)296}$  **BATS**    **Exercise 99:**  $90 \overline{)765}$  **THE**

**Exercise 100:**  $20 \overline{)136}$  **SETS**    **Exercise 101:**  $70 \overline{)647}$  **OUT**    **Exercise 102:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 103:**  $80 \overline{)597}$  **SUN**    **Exercise 104:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 105:**  $60 \overline{)190}$  **3 R10**

**Exercise 106:**  $50 \overline{)300}$  **6**    **Exercise 107:**  $40 \overline{)280}$  **7**    **Exercise 108:**  $30 \overline{)241}$  **6 R1**

**Exercise 109:**  $80 \overline{)296}$  **BATS**    **Exercise 110:**  $90 \overline{)765}$  **THE**    **Exercise 111:**  $20 \overline{)136}$  **SETS**

**Exercise 112:**  $70 \overline{)647}$  **OUT**    **Exercise 113:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 114:**  $80 \overline{)597}$  **SUN**

**Exercise 115:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 116:**  $60 \overline{)190}$  **3 R10**    **Exercise 117:**  $50 \overline{)300}$  **6**

**Exercise 118:**  $40 \overline{)280}$  **7**    **Exercise 119:**  $30 \overline{)241}$  **6 R1**    **Exercise 120:**  $80 \overline{)296}$  **BATS**

**Exercise 121:**  $90 \overline{)765}$  **THE**    **Exercise 122:**  $20 \overline{)136}$  **SETS**    **Exercise 123:**  $70 \overline{)647}$  **OUT**

**Exercise 124:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 125:**  $80 \overline{)597}$  **SUN**    **Exercise 126:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 127:**  $60 \overline{)190}$  **3 R10**    **Exercise 128:**  $50 \overline{)300}$  **6**    **Exercise 129:**  $40 \overline{)280}$  **7**

**Exercise 130:**  $30 \overline{)241}$  **6 R1**    **Exercise 131:**  $80 \overline{)296}$  **BATS**    **Exercise 132:**  $90 \overline{)765}$  **THE**

**Exercise 133:**  $20 \overline{)136}$  **SETS**    **Exercise 134:**  $70 \overline{)647}$  **OUT**    **Exercise 135:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 136:**  $80 \overline{)597}$  **SUN**    **Exercise 137:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 138:**  $60 \overline{)190}$  **3 R10**

**Exercise 139:**  $50 \overline{)300}$  **6**    **Exercise 140:**  $40 \overline{)280}$  **7**    **Exercise 141:**  $30 \overline{)241}$  **6 R1**

**Exercise 142:**  $80 \overline{)296}$  **BATS**    **Exercise 143:**  $90 \overline{)765}$  **THE**    **Exercise 144:**  $20 \overline{)136}$  **SETS**

**Exercise 145:**  $70 \overline{)647}$  **OUT**    **Exercise 146:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 147:**  $80 \overline{)597}$  **SUN**

**Exercise 148:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 149:**  $60 \overline{)190}$  **3 R10**    **Exercise 150:**  $50 \overline{)300}$  **6**

**Exercise 151:**  $40 \overline{)280}$  **7**    **Exercise 152:**  $30 \overline{)241}$  **6 R1**    **Exercise 153:**  $80 \overline{)296}$  **BATS**

**Exercise 154:**  $90 \overline{)765}$  **THE**    **Exercise 155:**  $20 \overline{)136}$  **SETS**    **Exercise 156:**  $70 \overline{)647}$  **OUT**

**Exercise 157:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 158:**  $80 \overline{)597}$  **SUN**    **Exercise 159:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 160:**  $60 \overline{)190}$  **3 R10**    **Exercise 161:**  $50 \overline{)300}$  **6**    **Exercise 162:**  $40 \overline{)280}$  **7**

**Exercise 163:**  $30 \overline{)241}$  **6 R1**    **Exercise 164:**  $80 \overline{)296}$  **BATS**    **Exercise 165:**  $90 \overline{)765}$  **THE**

**Exercise 166:**  $20 \overline{)136}$  **SETS**    **Exercise 167:**  $70 \overline{)647}$  **OUT**    **Exercise 168:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 169:**  $80 \overline{)597}$  **SUN**    **Exercise 170:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 171:**  $60 \overline{)190}$  **3 R10**

**Exercise 172:**  $50 \overline{)300}$  **6**    **Exercise 173:**  $40 \overline{)280}$  **7**    **Exercise 174:**  $30 \overline{)241}$  **6 R1**

**Exercise 175:**  $80 \overline{)296}$  **BATS**    **Exercise 176:**  $90 \overline{)765}$  **THE**    **Exercise 177:**  $20 \overline{)136}$  **SETS**

**Exercise 178:**  $70 \overline{)647}$  **OUT**    **Exercise 179:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 180:**  $80 \overline{)597}$  **SUN**

**Exercise 181:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 182:**  $60 \overline{)190}$  **3 R10**    **Exercise 183:**  $50 \overline{)300}$  **6**

**Exercise 184:**  $40 \overline{)280}$  **7**    **Exercise 185:**  $30 \overline{)241}$  **6 R1**    **Exercise 186:**  $80 \overline{)296}$  **BATS**

**Exercise 187:**  $90 \overline{)765}$  **THE**    **Exercise 188:**  $20 \overline{)136}$  **SETS**    **Exercise 189:**  $70 \overline{)647}$  **OUT**

**Exercise 190:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 191:**  $80 \overline{)597}$  **SUN**    **Exercise 192:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 193:**  $60 \overline{)190}$  **3 R10**    **Exercise 194:**  $50 \overline{)300}$  **6**    **Exercise 195:**  $40 \overline{)280}$  **7**

**Exercise 196:**  $30 \overline{)241}$  **6 R1**    **Exercise 197:**  $80 \overline{)296}$  **BATS**    **Exercise 198:**  $90 \overline{)765}$  **THE**

**Exercise 199:**  $20 \overline{)136}$  **SETS**    **Exercise 200:**  $70 \overline{)647}$  **OUT**    **Exercise 201:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 202:**  $80 \overline{)597}$  **SUN**    **Exercise 203:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 204:**  $60 \overline{)190}$  **3 R10**

**Exercise 205:**  $50 \overline{)300}$  **6**    **Exercise 206:**  $40 \overline{)280}$  **7**    **Exercise 207:**  $30 \overline{)241}$  **6 R1**

**Exercise 208:**  $80 \overline{)296}$  **BATS**    **Exercise 209:**  $90 \overline{)765}$  **THE**    **Exercise 210:**  $20 \overline{)136}$  **SETS**

**Exercise 211:**  $70 \overline{)647}$  **OUT**    **Exercise 212:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 213:**  $80 \overline{)597}$  **SUN**

**Exercise 214:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 215:**  $60 \overline{)190}$  **3 R10**    **Exercise 216:**  $50 \overline{)300}$  **6**

**Exercise 217:**  $40 \overline{)280}$  **7**    **Exercise 218:**  $30 \overline{)241}$  **6 R1**    **Exercise 219:**  $80 \overline{)296}$  **BATS**

**Exercise 220:**  $90 \overline{)765}$  **THE**    **Exercise 221:**  $20 \overline{)136}$  **SETS**    **Exercise 222:**  $70 \overline{)647}$  **OUT**

**Exercise 223:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 224:**  $80 \overline{)597}$  **SUN**    **Exercise 225:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 226:**  $60 \overline{)190}$  **3 R10**    **Exercise 227:**  $50 \overline{)300}$  **6**    **Exercise 228:**  $40 \overline{)280}$  **7**

**Exercise 229:**  $30 \overline{)241}$  **6 R1**    **Exercise 230:**  $80 \overline{)296}$  **BATS**    **Exercise 231:**  $90 \overline{)765}$  **THE**

**Exercise 232:**  $20 \overline{)136}$  **SETS**    **Exercise 233:**  $70 \overline{)647}$  **OUT**    **Exercise 234:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 235:**  $80 \overline{)597}$  **SUN**    **Exercise 236:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 237:**  $60 \overline{)190}$  **3 R10**

**Exercise 238:**  $50 \overline{)300}$  **6**    **Exercise 239:**  $40 \overline{)280}$  **7**    **Exercise 240:**  $30 \overline{)241}$  **6 R1**

**Exercise 241:**  $80 \overline{)296}$  **BATS**    **Exercise 242:**  $90 \overline{)765}$  **THE**    **Exercise 243:**  $20 \overline{)136}$  **SETS**

**Exercise 244:**  $70 \overline{)647}$  **OUT**    **Exercise 245:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 246:**  $80 \overline{)597}$  **SUN**

**Exercise 247:**  $40 \overline{)382}$  **IT DOESN'T WORK!**    **Exercise 248:**  $60 \overline{)190}$  **3 R10**    **Exercise 249:**  $50 \overline{)300}$  **6**

**Exercise 250:**  $40 \overline{)280}$  **7**    **Exercise 251:**  $30 \overline{)241}$  **6 R1**    **Exercise 252:**  $80 \overline{)296}$  **BATS**

**Exercise 253:**  $90 \overline{)765}$  **THE**    **Exercise 254:**  $20 \overline{)136}$  **SETS**    **Exercise 255:**  $70 \overline{)647}$  **OUT**

**Exercise 256:**  $60 \overline{)240}$  **BECAUSE**    **Exercise 257:**  $80 \overline{)597}$  **SUN**    **Exercise 258:**  $40 \overline{)382}$  **IT DOESN'T WORK!**

**Exercise 259:**  $60 \overline{)190}$  **3 R10**    **Exercise 260:**  $50 \overline{)300}$  **6**    **Exercise 261:**  $40 \overline{)280}$  **7**

**Exercise 262:**  $30 \overline{)241}$  **6 R1**    **Exercise 263:**  $80 \overline{)296}$  **BATS**    **Exercise 264:**  $90 \overline{)765}$  **THE**

**Exercise 265:**  $20 \overline{)136}$  **SETS**    **Exercise 266:**  $70 \overline{)647}$  **OUT**    **Exercise 267:**  $60 \overline{)240}$  **BECAUSE**

**Exercise 268:**



**Practice** Work in groups. Use place-value materials to divide.

1.  $40 \overline{)200}$  <sup>5</sup>
2.  $60 \overline{)420}$  <sup>7</sup>
3.  $70 \overline{)150}$  <sup>2 R10</sup>
4.  $50 \overline{)280}$  <sup>5 R30</sup>
5.  $30 \overline{)250}$  <sup>8 R10</sup>
6.  $80 \overline{)407}$  <sup>5 R7</sup>
7.  $30 \overline{)249}$  <sup>8 R9</sup>
8.  $50 \overline{)435}$  <sup>8 R35</sup>
9.  $20 \overline{)179}$  <sup>8 R19</sup>
10.  $90 \overline{)685}$  <sup>7 R55</sup>
11.  $299 \div 30$  <sup>9 R29</sup>
12.  $391 \div 40$  <sup>9 R31</sup>
13.  $264 \div 70$  <sup>3 R54</sup>
14.  $568 \div 60$  <sup>9 R28</sup>

**Mental math** Divide. Which basic fact helps you find the answer? **See margin.**  
Discuss this with another student in your group.

15.  $50 \overline{)250}$  <sup>5</sup>
16.  $80 \overline{)160}$  <sup>2</sup>
17.  $20 \overline{)140}$  <sup>7</sup>
18.  $30 \overline{)90}$  <sup>3</sup>
19.  $70 \overline{)420}$  <sup>6</sup>
20.  $60 \overline{)540}$  <sup>9</sup>
21.  $40 \overline{)320}$  <sup>8</sup>
22.  $80 \overline{)400}$  <sup>5</sup>
23.  $90 \overline{)270}$  <sup>3</sup>
24.  $50 \overline{)200}$  <sup>4</sup>

25. Demonstrate to another student in your group how you can use place-value materials to find  $144 \div 48$ . Discuss different ways to find the answer. What is  $144 \div 48$ ?

**3; See Using the Pages.**

Use your place-value materials to divide.

26.  $18 \overline{)126}$  <sup>7</sup>
27.  $31 \overline{)274}$  <sup>8 R26</sup>
28.  $26 \overline{)192}$  <sup>7 R10</sup>
29.  $47 \overline{)381}$  <sup>8 R5</sup>
30.  $83 \overline{)642}$  <sup>7 R61</sup>

**Apply** Use your place-value materials to solve each problem.

31. The Funland train holds 240 people. They ride in cars of 40 people each. How many cars are on the train?  
**6 cars**
32. Jill needs to order 132 straw hats for the souvenir store. The hats come in boxes of 12. How many boxes should she order?  
**11 boxes**

## MAINTENANCE

Divide.

1.  $56 \div 7$  <sup>8</sup>
2.  $18 \div 3$  <sup>6</sup>
3.  $45 \div 5$  <sup>9</sup>
4.  $32 \div 8$  <sup>4</sup>
5.  $28 \div 4$  <sup>7</sup>
6.  $10 \div 2$  <sup>5</sup>
7.  $12 \div 4$  <sup>3</sup>
8.  $27 \div 9$  <sup>3</sup>
9.  $35 \div 5$  <sup>7</sup>
10.  $8 \div 2$  <sup>4</sup>
11.  $15 \div 3$  <sup>5</sup>
12.  $36 \div 6$  <sup>6</sup>
13.  $16 \div 4$  <sup>4</sup>
14.  $63 \div 9$  <sup>7</sup>
15.  $14 \div 2$  <sup>7</sup>
16.  $30 \div 5$  <sup>6</sup>
17.  $48 \div 6$  <sup>8</sup>
18.  $54 \div 6$  <sup>9</sup>
19.  $42 \div 7$  <sup>6</sup>
20.  $81 \div 9$  <sup>9</sup>
21.  $9 \div 3$  <sup>3</sup>
22.  $64 \div 8$  <sup>8</sup>
23.  $32 \div 4$  <sup>8</sup>
24.  $72 \div 8$  <sup>9</sup>
25.  $20 \div 5$  <sup>4</sup>
26.  $28 \div 7$  <sup>4</sup>
27.  $49 \div 7$  <sup>7</sup>
28.  $54 \div 9$  <sup>6</sup>
29.  $24 \div 3$  <sup>8</sup>
30.  $36 \div 9$  <sup>4</sup>
31.  $40 \div 8$  <sup>5</sup>
32.  $18 \div 2$  <sup>9</sup>
33.  $42 \div 6$  <sup>7</sup>
34.  $36 \div 6$  <sup>6</sup>
35.  $21 \div 3$  <sup>7</sup>
36.  $24 \div 6$  <sup>4</sup>

More Practice Set 97, page 386 **261**

## Assignment Guide

basic 1–14 odd or even, 15–31  
average 1–14 odd or even, 15–32  
enriched 1–24 odd or even, 25–32

Note: Pages 260–263 contain a 2-lesson sequence that moves from concrete to symbolic. First, use the student pages for both lessons. Then go back and assign ancillary pages and More Practice sets for the lessons.

**More Practice Set 97, page 386**

**Homework to do with others** Have students ask several people to give answers to these problems:

$$10 \overline{)380} \quad 70 \overline{)210} \quad 20 \overline{)120}$$

Tell students to record these answers and ask the people to state any computation strategies they used in calculating the answers. Ask students to share the results in class.

## Follow-Up

**Reteaching** Use exercises like those below to help students understand the concept of this lesson better.

$$12 \div 3 [4] \quad 30 \div 6 [5]$$

$$120 \div 30 [4] \quad 300 \div 60 [5]$$

$$122 \div 30 [4 R2] \quad 304 \div 60 [5 R4]$$

**Enrichment Try and check** Have students choose one multiple of 10 (for example, 40) to use as a divisor. Have them make up five division exercises which have a remainder of 1. [Answers will vary.]

## Enrichment 97

Name \_\_\_\_\_

**Pulse Clocks**

You can use your pulse as a timing device.

Take your pulse as shown by pressing your fingers under your jawbone at the top of your neck.

1. Complete the table by counting the number of times your heart beats in each of the given time intervals.

| Time in seconds | Average number of beats |
|-----------------|-------------------------|
| 10              |                         |
| 20              |                         |
| 30              |                         |
| 40              |                         |
| 50              |                         |
| 60              |                         |

Answers will vary.

2. Use the information in Exercise 1 to complete the bar graph. You will see how time can be measured using your pulse.

**E97**

## Additional Resource 97

Name \_\_\_\_\_

**Mental Math: Dividing Zeros**

When both numbers in a division exercise end in 0, mark off the same number of 0s from both numbers.

$60 \overline{)240}$   
 $\downarrow$   
 $6 \overline{)24}$   
The answer is 4.

Divide mentally.

1.  $40 \overline{)260} \rightarrow 6 \overline{)26}$
2.  $30 \overline{)150} \rightarrow 3 \overline{)15}$
3.  $20 \overline{)120} \rightarrow 2 \overline{)12}$
4.  $50 \overline{)350} \rightarrow 5 \overline{)35}$
5.  $60 \overline{)420} \rightarrow 6 \overline{)42}$
6.  $70 \overline{)490} \rightarrow 7 \overline{)49}$
7.  $80 \overline{)320} \rightarrow 8 \overline{)32}$
8.  $90 \overline{)450} \rightarrow 9 \overline{)45}$
9.  $30 \overline{)270} \rightarrow 3 \overline{)27}$
10.  $40 \overline{)160} \rightarrow 4 \overline{)16}$

## Daily Maintenance

**Estimation** Have students estimate each product.

1.  $63 \times 30$  [1,800]
2.  $82 \times 40$  [3,200]
3.  $76 \times 70$  [5,600]
4.  $329 \times 50$  [15,000]
5.  $586 \times 60$  [36,000]

## Answers, page 261

15.  $25 \div 5 = 5$
16.  $16 \div 8 = 2$
17.  $14 \div 2 = 7$
18.  $9 \div 3 = 3$
19.  $42 \div 7 = 6$
20.  $54 \div 6 = 9$
21.  $32 \div 4 = 8$
22.  $40 \div 8 = 5$
23.  $27 \div 9 = 3$
24.  $20 \div 5 = 4$



## Objective 98

Divide a two- or three-digit number by a two-digit number to get a one-digit quotient.

### Lesson Theme

School Activities: Amusement Park

## Introduction

**Motivational Situation** Pose the following problem to students. What kinds of jobs are available at an amusement park? [Cashier, ride attendant, maintenance worker, office manager]

## Using the Pages

**Teach** On the board, work through Example A step by step. Point out that finding how many 2s in 15 will help students find how many 20s in 150. Caution students to consider where they place the first number in a quotient when they divide. Read through Example B with the class. Have students discuss why division is appropriate to use here. Write the example on the board, explaining each step. Have students pay close attention to the placement of digits in the quotient, 3, over the last 4 in 144. Stress that although they think "How many 4s in 14?" they are actually finding how many 48s in 144. In Example C, students should recognize that the placement of digits in the quotient is related to the number of digits in the divisor as well as the number of digits in the dividend.

**Practice Estimation** Encourage students to estimate each quotient before they compute. Then have students compare their computed answers and their estimates. Finally, encourage students to check each exercise.

**Error Analysis** Watch for students who place digits incorrectly in the quotient. Ask these students to estimate the quotients by thinking about compatible numbers before computing. For example, before computing  $269 \div 43$ , the students might think  $240 \div 40 = 6$ . Students then expect the quotient to be about 6. Students having difficulties might be asked to check their answers.

**Apply Problem Solving** In Problem 40, students use the fact that 60 min. = 1 hr. Problems 41 and 42 involve multiplication.

**Make a table** Have students do an inventory of various classroom materials such as chalk, erasers, pencils, crayons. To extend the problem, have them find out if the items are sold as single (Continued on page 263.)

## Two-Digit Divisors, One-Digit Quotients

- A. On page 260, you used place-value materials to divide 150 boxes of T-shirts equally among 20 shops. Here is a way to record your work.

Find  $150 \div 20$ .

$$\begin{array}{r} 7 \\ 20 \overline{)150} \\ \underline{140} \phantom{0} \\ 10 \phantom{0} \end{array}$$

Divide.  
How many 20s in 150?  
THINK How many 2s in 15?  
Write 7 above the 0.

$$\begin{array}{r} 7 \text{ R}10 \\ 20 \overline{)150} \\ \underline{140} \phantom{0} \\ 10 \phantom{0} \end{array}$$

Multiply.  
Subtract and compare.

What is the answer? Explain to another student how you would check the answer. **7 R10; Add 10 to the product of 20 and 7. The result is the dividend, 150.**



262

- B. Stan works in one of the Funland shops. One day he sold 48 key rings for a total of \$144. How much did each key ring cost?

Find  $144 \div 48$ .

$$\begin{array}{r} 3 \\ 48 \overline{)144} \\ \underline{144} \\ 0 \end{array}$$

Divide.  
How many 48s in 144?  
THINK How many 4s in 14?  
Write 3 above the 4.

$$\begin{array}{r} 3 \\ 48 \overline{)144} \\ \underline{144} \\ 0 \end{array}$$

Multiply.  
Subtract and compare.  
What is the remainder?

Each key ring cost \$3. Does this seem reasonable for the cost of a key ring?

Yes

- C. In each example, what is the first thing you think when you divide? Discuss this with another student. In each example, THINK: How many 6s in 25?

$$\begin{array}{r} 4 \text{ R}1 \\ 6 \overline{)25} \\ \underline{24} \\ 1 \end{array}$$

$$\begin{array}{r} 4 \text{ R}10 \\ 60 \overline{)250} \\ \underline{240} \\ 10 \end{array}$$

$$\begin{array}{r} 4 \text{ R}2 \\ 62 \overline{)250} \\ \underline{248} \\ 2 \end{array}$$

$$\begin{array}{r} 4 \text{ R}9 \\ 62 \overline{)257} \\ \underline{248} \\ 9 \end{array}$$

Try Divide.

$$\begin{array}{r} 9 \text{ R}4 \\ 30 \overline{)274} \end{array}$$

$$\begin{array}{r} 9 \text{ R}30 \\ 90 \overline{)840} \end{array}$$

$$\begin{array}{r} 3 \\ 25 \overline{)75} \end{array}$$

$$\begin{array}{r} 5 \\ 34 \overline{)170} \end{array}$$

## Practice 98

Name \_\_\_\_\_

Divide. To complete the picture, connect the dots in the order the answers are given.

1.  $34 \overline{)1209}$  2.  $42 \overline{)1355}$  3.  $57 \overline{)1342}$  4.  $24 \overline{)199}$  5.  $66 \overline{)1531}$  6.  $83 \overline{)1600}$  7.  $39 \overline{)189}$  8.  $78 \overline{)1404}$  9.  $23 \overline{)119}$  10.  $68 \overline{)1620}$  11.  $43 \overline{)1312}$  12.  $55 \overline{)447}$  13.  $33 \overline{)1299}$  14.  $92 \overline{)555}$  15.  $63 \overline{)1466}$  16.  $80 \overline{)320}$  17.  $22 \overline{)175}$  18.  $49 \overline{)1153}$  19.  $32 \overline{)177}$  20.  $23 \overline{)197}$  21.  $21 \overline{)168}$  22.  $11 \overline{)35}$

5 R14 5 R4 6 R3 7 R25 2 R11 9 R8 9 R2 4 7 R19 7 R11 8 R7 3 R9 8 R3 4 R3 3 R6 8 R2 8 R19 6 4 R5 6 R5 3 R2

Start

## Reteaching 98

Name \_\_\_\_\_

Find  $198 \div 62$ .

Think: How many 6s in 19? 3.

Write the 3 above the 8.

Why can't a bicycle stand by itself?

Divide. Write the letters in the blanks below. Answers may be used more than once.

1.  $20 \overline{)198}$  2.  $22 \overline{)188}$  3.  $31 \overline{)193}$  4.  $41 \overline{)189}$  5.  $35 \overline{)175}$  6.  $51 \overline{)306}$  7.  $47 \overline{)191}$  8.  $23 \overline{)119}$  9.  $49 \overline{)119}$  10.  $61 \overline{)306}$  11.  $73 \overline{)298}$  12.  $68 \overline{)415}$

B E C A U S E I T S

5 R3 6 3 5 4 R2 4 R6 6 2 R7 4 R6 4 R8

T W O T I R E D

4 R6 6 R7 4 4 R6 2 R7 4 R3 6 5 R4



**Practice** Divide.

1.  $40 \overline{)206}$  **5 R6**
2.  $60 \overline{)425}$  **7 R5**
3.  $70 \overline{)143}$  **2 R3**
4.  $50 \overline{)256}$  **5 R6**
5.  $90 \overline{)275}$  **3 R5**
6.  $50 \overline{)447}$  **8 R47**
7.  $70 \overline{)480}$  **6 R60**
8.  $40 \overline{)391}$  **9 R31**
9.  $30 \overline{)299}$  **9 R29**
10.  $90 \overline{)599}$  **6 R59**
11.  $67 \overline{)80}$  **1 R13**
12.  $33 \overline{)78}$  **2 R12**
13.  $24 \overline{)58}$  **2 R10**
14.  $23 \overline{)115}$  **5**
15.  $32 \overline{)290}$  **9 R2**
16.  $45 \overline{)225}$  **5**
17.  $73 \overline{)438}$  **6**
18.  $47 \overline{)141}$  **3**
19.  $83 \overline{)585}$  **7 R4**
20.  $56 \overline{)449}$  **8 R1**
21.  $84 \div 37$  **2 R10**
22.  $810 \div 90$  **9**
23.  $105 \div 21$  **5**
24.  $387 \div 62$  **6 R15**
25.  $99 \div 43$  **2 R13**
26.  $225 \div 75$  **3**
27.  $689 \div 82$  **8 R33**
28.  $788 \div 91$  **8 R60**

**Mental math** Divide mentally. Write only the quotient.

29.  $30 \overline{)60}$  **2**
30.  $40 \overline{)80}$  **2**
31.  $30 \overline{)90}$  **3**
32.  $20 \overline{)60}$  **3**
33.  $50 \overline{)100}$  **2**
34.  $80 \overline{)320}$  **4**
35.  $70 \overline{)560}$  **8**
36.  $60 \overline{)300}$  **5**
37.  $20 \overline{)180}$  **9**
38.  $90 \overline{)360}$  **4**



**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used.

39. Thirty-five students' tickets to Funland Park cost \$175. How much does one student ticket cost? **\$5; P, C**
41. There are 57 Funland pennants in stock. A customer wants 3 boxes of 20 pennants. Are there enough pennants in stock to fill this order? Explain why or why not. **No; 3 boxes of 20 pennants is 60 pennants; M, E**
43. The computer in the Funland storeroom shows that there are 108 key rings in stock. The key rings are in boxes of 36. How many boxes of key rings are in stock? **3 boxes; P, C**
40. One day Stan worked for 500 minutes. How many hours and minutes is this? **8 hours 20 minutes; P, C**
42. Kim Lee bought 3 T-shirts for \$5.98 each. She gave the cashier a twenty dollar bill. Was this enough money? Explain why or why not. **Yes. Estimating, \$5.98 is about \$6. \$6  $\times$  3 is \$18. \$18 is less than \$20.**
44. An average of 720 adults visit Funland Park each day. The park is open for 7 days a week. How many weeks will it take for 126,000 adults to visit Funland? **25 weeks; C**

More Practice Set 98, page 387 **263**

## Assignment Guide

basic 1–28 odd or even, 29–42  
average 1–28 odd or even, 29–43  
enriched 1–38 odd or even, 39–44

**More Practice Set 98,**  
page 387

**Homework to do with others** Have students find three or more people that have visited amusement parks and ask them what kinds of items were sold there. Tell students to record the answers of the people they interview and report the results to the class.

(Continued from page 262.)

items [Erasers, desks] or generally sold in quantities of more than one [Chalk, crayons].

## Follow-Up

**Extra Practice** *Write a problem* Have each student write a word problem about an exercise chosen from page 263. Then have them exchange papers, solve each problem, and check their work.

**Enrichment** Have students find a missing digit for each exercise. Stress that more than one answer is possible. Challenge students to find more than one digit that "works." Then have them do the exercises.

1.  $6 \overline{)470}$  **70, R50; 61, R43; 62, R36; 63, R29; 64, R22; 65, R15; 66, R8; 67, R1**
2.  $5 \overline{)470}$  **94, R20; 51, R11; 52, R2**
3.  $4 \overline{)230}$  **57, R30; 41, R25; 42, R20; 43, R15; 44, R10; 45, R5; 46, no remainder**
4.  $3 \overline{)230}$  **76, R30; 31, R13; 32, R6**

**Computer Assisted Instructions**  
Mathematics Courseware Series  
• Division 3, Activity 1

## Cooperative Learning Groups

See page 482 of this Teacher's Edition.

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

1.  $12 \div 4$  [3]
2.  $24 \div 6$  [4]
3.  $14 \div 2$  [7]
4.  $6 \div 3$  [2]
5.  $35 \div 7$  [5]

## Enrichment 98

Name \_\_\_\_\_ E98

**More Missing Digits**

Put the missing digits in the boxes.

1.  $8 \overline{)164}$  **R12**
2.  $52 \overline{)281}$  **R21**
3.  $9 \overline{)651}$  **R53**
4.  $8 \overline{)121}$  **R9**
5.  $34 \overline{)234}$  **R1**
6.  $9 \overline{)237}$  **R60**
7.  $86 \overline{)189}$  **R4**
8.  $86 \overline{)516}$  **R33**

## Additional Resource 98

Name \_\_\_\_\_ Additional Resource 98

**Calculator** Dividing Money

In these exercises, you will use me to subtract and then divide.

| Apples      | Pears       | Bananas     | Peaches     |
|-------------|-------------|-------------|-------------|
| \$0.37 each | \$0.32 each | \$0.29 each | \$0.42 each |
| Watermelons | Pineapples  |             |             |
| \$2.12 each | \$1.08 each |             |             |

In each exercise, the buyer bought some of the fruit above. Each buyer paid with a \$20 bill. Use your calculator to find out what was bought.

1. Tim bought 8 of the same fruit. His change was \$17.44.  
He spent **\$2.56**.  
He bought 8 **pears**.
2. Sue bought 9 of the same fruit. Her change was \$10.28.  
She spent **\$9.72**.  
She bought 9 **pineapples**.
3. Ms. Wu bought 6 of the same fruit. Her change was \$17.78.  
She spent **\$2.22**.  
She bought 6 **apples**.
4. Mr. Roe bought 7 of the same fruit. His change was \$17.06.  
He spent **\$2.94**.  
He bought 7 **peaches**.
5. Lou bought 5 of the same fruit. His change was \$9.40.  
He spent **\$10.60**.  
He bought 5 **watermelons**.
6. Gina bought 8 of the same fruit. Her change was \$17.68.  
She spent **\$2.32**.  
She bought 8 **bananas**.



Correct one-digit estimates that are too large.

## Technology: Space Travel

**Motivational Situation** Pose the following problem to the students. If you want to become an astronaut, what types of things should you do? [Keep physically fit, learn about the space program, study various sciences, math, computers, engineering]

Tell the students that sometimes when they divide, their estimate may be too large. Write the following exercise on the board.

$$\begin{array}{r} 7 \\ 37 \overline{) 238} \\ \underline{259} \end{array}$$

Ask what is wrong with the work. [The product is greater than the dividend.] This is a signal that the quotient is too large. Ask students how to correct it. [Use a lesser digit in the quotient, 6.] Now have a student complete the exercise. Other teaching examples:

$154 \div 52 [2 \text{ R}50] \quad 312 \div 54 [5 \text{ R}42]$

**Teach** Working on the board, go through each step of the example. Remind students that the difference between the product and the dividend must always be less than the divisor. Point out that it is best, when necessary, to estimate the quotient by only 1 less than their first estimate. Other teaching examples:

$$265 \div 46 [5 \text{ R}35] \qquad 198 \div 24 [8 \text{ R}6]$$

**Practice** No correction of the estimates is needed in Exercises 6, 7, 14, 17 and 22

**Calculator** For Problem 25, students find the whole number remainder using the key sequence they learned on page 245, Problems 33–34.

**PRESS:** 84  $\div$  9  $=$

DISPLAY: 9.3333333

**PRESS:** 84  $\boxed{M+}$  9  $\boxed{\times}$  9  $\boxed{=}$   $\boxed{M-}$   $\boxed{MR}$

DISPLAY: 3

**Apply** **Problem Solving** Problem 26 involves a correction in the estimate, Problem 27 does not.

**Use physical models** In the hall or outside, measure a distance of 150 feet. Have students walk the distance, counting their strides. Then have them find the average length of each stride.

**Additional problem** Give students this problem. Your weight on earth is 6 times as great as it would be on the  
(Continued on page 265.)

On the moon an astronaut could walk 280 feet in 35 strides. What is the average length of each stride?

Find  $280 \div 35$ .

$$\begin{array}{r} 9 \\ 35 \overline{) 280} \end{array}$$

**Divide.**  
How many 35s in 280?  
**THINK** How many 3s in 28? 9

$$\begin{array}{r} 9 \\ 35 \overline{) 280} \\ \underline{315} \end{array}$$

*Multiply.*  
315 is greater than 280,  
so 9 is too big.

$$\begin{array}{r} 8 \\ 35 \overline{) 280} \\ \underline{280} \\ 0 \end{array}$$

Try 8.  
Multiply.  
Subtract and compare.  
The remainder is 0.

The average length of each stride is 8 feet.

**Check**

$$\begin{array}{r} 35 \\ \times 8 \\ \hline 280 \end{array}$$

**Try Divide.**

a.  $32 \overline{) 61}$   $\overset{1}{\text{R29}}$     b.  $25 \overline{) 175}$   $\overset{7}{}$     c.  $38 \overline{) 196}$   $\overset{5}{\text{R6}}$   
d.  $63 \overline{) 241}$   $\overset{3}{\text{R52}}$     e.  $42 \overline{) 189}$   $\overset{4}{\text{R21}}$



Name: \_\_\_\_\_

P99

What do we call the number that is written as 1 followed by 100 zeros?

GOOGOL

To find out, divide. Each time an answer is given in a box below, cross out the answer and its letter. The remaining letters answer the question. Some answers are not used.

1.  $2\ 8\overline{)119}$       2.  $3\ 7\overline{)264}$       3.  $6\ 8\overline{)553}$

4.  $2\ 3\overline{)190}$       5.  $4\ 2\overline{)124}$       6.  $5\ 8\overline{)414}$

7.  $2\ 6\overline{)159}$       8.  $3\ 9\overline{)161}$       9.  $3\ 8\overline{)195}$

10.  $2\ 5\overline{)179}$       11.  $7\ 8\overline{)631}$       12.  $4\ 8\overline{)247}$

13.  $101 \div 51 =$       14.  $287 \div 47 =$

|         |         |         |         |         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 6<br>R3 | 6<br>R3 | 5<br>R3 | 8<br>R8 | 6<br>R7 | 6<br>R3 | 5<br>R6 | 6<br>R3 | 6<br>R3 | 4<br>R6 | 7<br>R7 | 8<br>R8 |
| G       | E       | O       | H       | M       | G       | O       | N       | D       | O       | E       | L       |

Name: \_\_\_\_\_

R99

Find  $251 \div 68$

$3 \times 68 = 204$   
 $4 \times 68 = 272$

$4 \text{ is } 100 \text{ big!}$

$4$   
 $68 \overline{) 251}$   
 $272$

$3R47$   
 $68 \overline{) 251}$   
 $204$   
 $47$

Divide

$4R11$   
 $1.40 \overline{) 171}$

$3R27$   
 $2.48 \overline{) 171}$

$8R15$   
 $3.60 \overline{) 495}$

$7R40$   
 $4.65 \overline{) 495}$

$6R2$   
 $5.90 \overline{) 542}$

$5R87$   
 $6.91 \overline{) 542}$

$5R14$   
 $7.30 \overline{) 164}$

$4R24$   
 $8.35 \overline{) 164}$

$5R18$   
 $9.40 \overline{) 218}$

$4R30$   
 $10.47 \overline{) 218}$

$7R16$   
 $11.20 \overline{) 156}$

$6$   
 $12.26 \overline{) 156}$

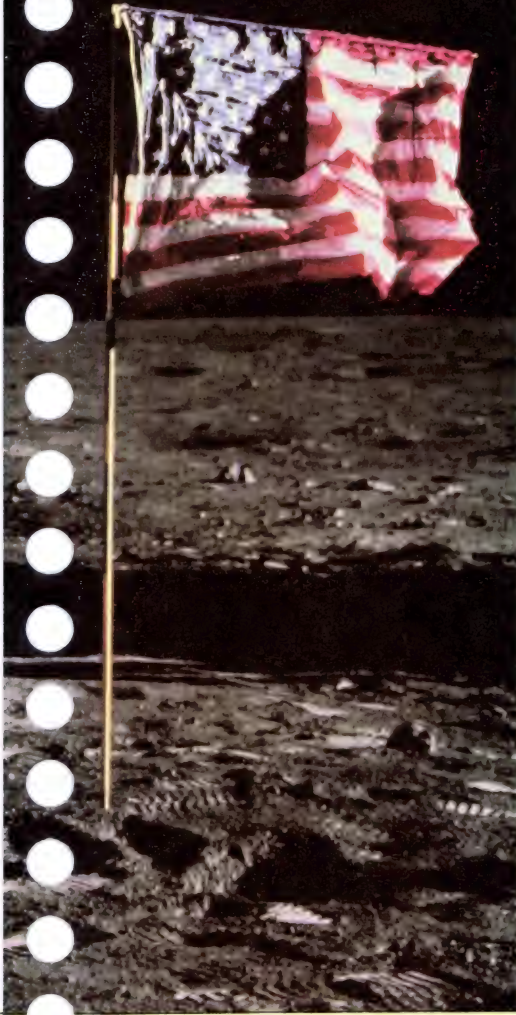
$9R11$   
 $13.50 \overline{) 461}$

$8R37$   
 $14.53 \overline{) 461}$

$3R1$   
 $15.90 \overline{) 271}$

$2R81$   
 $16.95 \overline{) 271}$





### Practice Divide.

1.  $25 \overline{) 72}$  **2 R22**
2.  $43 \overline{) 80}$  **1 R37**
3.  $53 \overline{) 251}$  **4 R39**
4.  $68 \overline{) 583}$  **8 R39**
5.  $47 \overline{) 165}$  **3 R24**
6.  $35 \overline{) 179}$  **5 R4**
7.  $21 \overline{) 106}$  **5 R1**
8.  $55 \overline{) 362}$  **6 R32**
9.  $49 \overline{) 208}$  **4 R12**
10.  $73 \overline{) 638}$  **8 R54**
11.  $85 \overline{) 320}$  **3 R65**
12.  $24 \overline{) 120}$  **5**
13.  $96 \overline{) 273}$  **2 R81**
14.  $62 \overline{) 372}$  **6**
15.  $34 \overline{) 265}$  **7 R27**
16.  $78 \overline{) 295}$  **3 R61**
17.  $31 \overline{) 249}$  **8 R1**
18.  $83 \overline{) 161}$  **1 R78**

19.  $181 \div 92$  **1 R89**
20.  $575 \div 72$  **7 R71**
21.  $543 \div 65$  **8 R23**
22.  $157 \div 52$  **3 R1**
23.  $98 \div 12$  **8 R2**
24.  $56 \div 14$  **4**
25. **CALCULATOR** Press:  $84 \div 9 =$   
What is the whole-number remainder?  
**3**

**Apply** Solve each problem.

26. The first astronauts to orbit the moon were gone for 147 hours. How many days and hours is this?  
(1 day = 24 hours)  
**6 days 3 hours**
27. Astronaut Neil Armstrong walked on the moon for 160 minutes. How many hours and minutes is this?  
(1 hour = 60 minutes)  
**2 hours 40 minutes**
28. **Mental math** John Glenn made three orbits around the earth in about 300 minutes. How many hours was that?  
**5 hours**
29. **Write a problem.** Write a problem for which one of the numbers 5, 50, 500 would be a reasonable answer and for which the other two would not be reasonable. **Answers will vary.**

Using Problem-Solving Strategies, page 427  
More Practice Set 99, page 387 **265**

## Assignment Guide

basic 1–20 odd or even, 25–29  
average 1–24 odd or even, 25–29  
enriched 1–12, 25–29

### More Practice Set 99, page 387

(Continued from page 264.)

moon. How much would you weigh on the moon?

**Too much information** Give students this problem. In 5 days Lina worked 40 hours at \$4.50 per hour. She also worked 5 hours at 2 times her usual rate. On the average, how many hours did she work each day? [9 hours] Ask students what information was not needed to solve the problem. Have them write a problem using that information.

## Follow-Up

**Reteaching** Have students copy these pairs of exercises and complete each one if possible.

- |  |   |
|--|---|
| 1. $56 \overline{) 214}$<br>[224]<br>[Cannot complete] | 3 [R46]<br>$56 \overline{) 214}$<br>[168]<br>[46] |
| 2. $23 \overline{) 173}$<br>[184]<br>[Cannot complete] | 7 [R12]<br>$23 \overline{) 173}$<br>[161]<br>[12] |
| 3. $45 \overline{) 389}$<br>[405]<br>[Cannot complete] | 8 [R29]<br>$45 \overline{) 389}$<br>[360]<br>[29] |

**Enrichment Use data from outside the text** Have students research space flights and write a story about what it would be like to go along on a space expedition. The stories should include information about which the student can write two or three division problems, such as distances, weightlessness, and travel time.

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each problem mentally or with paper and pencil.

1.  $14 - 7$  [7]
2.  $289 - 191$  [98]
3.  $27 - 19$  [8]
4.  $46 - 38$  [8]
5.  $503 - 75$  [428]
6.  $700 - 397$  [303]
7.  $2,763 - 1,722$  [1,041]

### Using Problem-Solving Strategies, page 427

## Enrichment 99

Name: \_\_\_\_\_ E99

**Using Formulas**

Use these formulas to find distance traveled ( $d$ ), rate of speed ( $r$ ), and time traveled ( $t$ ):

$$d = r \times t$$

$$r = d \div t$$

$$t = d \div r$$

At a rate of speed of 75 miles per day how far would a ship travel in 3 days?

A ship traveled 774 miles in 18 days. What was its rate of speed?

At a rate of 68 miles per day how long would it take a ship to travel 272 miles?

|   |   |  |
|---|---|--|
| $d = r \times t$<br>$8 = 75 \times 3$<br>$d = 225$<br>225 miles | $r = d \div t$<br>$r = 774 \div 18$<br>$r = 43$<br>43 miles per day | $t = d \div r$<br>$t = 272 \div 68$<br>$t = 4$<br>4 days |
|---|---|--|

Complete the table

| Distance traveled | Rate of speed             | Time spent traveling |
|-------------------|---------------------------|----------------------|
| 936 miles         | <b>39 miles per hour</b>  | 24 hours             |
| <b>570 yards</b>  | 95 yards per minute       | 6 minutes            |
| 960 feet          | 32 feet per second        | <b>30 seconds</b>    |
| 748 blocks        | <b>22 blocks per hour</b> | 34 hours             |
| 912 miles         | 48 miles per hour         | <b>19 hours</b>      |

## Additional Resource 99

Name: \_\_\_\_\_ Additional Resource 99

**Computer BASIC: Multiple Inputs in One Statement**

You can enter several numbers with one INPUT statement. Commas are used to separate the location names of the numbers in the computer's memory.

1. Type this program. Use 129, 113, and 109 as the bowling scores. Type RUN and use the output to give the sum and the average of the scores.

```

10 PRINT "ENTER 2 NUMBERS"
20 INPUT A, B
30 PRINT "A+B=", A+B
40 PRINT "AVERAGE=",
50 PRINT (A+B)/2
60 END
  
```

Be sure to type the parentheses around the addends

Sum: **351**  
Average: **117**

Use the numbers below as input for the above program. Type RUN for each exercise. Use the output from line 50 to write the average for each set of scores.

|                               |                                |                               |
|-------------------------------|--------------------------------|-------------------------------|
| 2. 98, 107, 110<br><b>105</b> | 3. 122, 151, 138<br><b>137</b> | 4. 119, 92, 134<br><b>115</b> |
|-------------------------------|--------------------------------|-------------------------------|

Show what you think the computer will print when you run these programs. Check your answers on the computer.

|   |  |
|---|--|
| 5. 10 PRINT "TYPE A NUMBER."<br>20 INPUT N<br>30 PRINT N;"*3="; N*3<br>40 END<br><b>TYPE A NUMBER</b><br><b>? (N)*3=(N*3)</b> | 6. 10 PRINT "TYPE 2 NUMBERS"<br>20 INPUT K, L<br>30 PRINT "K*L="; K*L<br>40 END<br><b>TYPE 2 NUMBERS</b><br><b>? K*L=(K*L)</b> |
|---|--|



## Objective 100

Divide a three-digit number by a two-digit number to get a two-digit quotient.

### Lesson Theme

Technology: Space Travel

## Introduction

**Motivational Situation** Pose the following problem to the students. Besides astronauts, many other people work in the space program. What types of jobs do these people do? [Rocket and spacecraft designers, construction engineers, doctors, computer operators, astronomers, artists]

On the board, write  $31\overline{)265}$ . [8 R17] Have a student work the exercise, explaining each step. Now write  $31\overline{)465}$  on the board. Ask: "How many 31s in 4?" [None] "How many 31s in 46?" [1] "Where should you put the 1?" [In the quotient above the 6] "Where should the product be written after you multiply?" [31 should be written beneath 46.] Complete the exercise stressing each step. Ask students the difference between the first exercise and the second. [There is one digit in the quotient for  $265 \div 31$ . There are two digits in the quotient for  $465 \div 31$ .]

## Using the Pages

**Teach** Work the example with students. Stress the alignment and placement of the digits in the quotient. Another teaching example:

$$\begin{array}{r} [21] \\ 47 \overline{)987} \end{array}$$

**Practice** Have students check their work as they do each exercise.

**Apply Problem Solving** Encourage students to estimate what an answer will be before computing.

**Error Analysis** Watch for students who try to use the Apollo mission number as the divisor or dividend in Problems 21–24. Point out to these students that those numbers are being used as labels and are not used to solve the problems.

**Use data from a table** Have students put the Apollo flights in order starting with the mission that lasted the longest. In Problem 30, students use numerical examples to show that the operation of multiplication is commutative, but that division is not. If  $a$  and  $b$  are equal, nonzero numbers, both sentences are true. If  $b$  is zero, the division sentence is undefined since division by zero is undefined.

## Two-Digit Divisors, Two-Digit Quotients

One of the Project Apollo space missions lasted about 295 hours. How many days and hours did it last? Remember, there are 24 hours in a day.

Find  $295 \div 24$ . Estimate using compatible numbers. 295 is close to 300. 24 is close to 25. There are four 25s in every 100. So there are twelve 25s in 300.  $295 \div 24$  is about 12.

$$\begin{array}{r} 1 \\ 24 \overline{)295} \\ \underline{24} \phantom{0} \\ 5 \phantom{0} \end{array}$$

**Divide.**  
How many 24s in 29? 1  
Write 1 above the 9.

**Multiply.**

**Subtract and compare.**

$$\begin{array}{r} 12 \text{ R}7 \\ 24 \overline{)295} \\ \underline{24} \phantom{0} \\ 55 \phantom{0} \\ \underline{48} \phantom{0} \\ 7 \phantom{0} \end{array}$$

**Bring down.**

**Divide.**  
How many 24s in 55? 2  
THINK How many 2s in 5? 2

**Multiply.**

**Subtract and compare.**  
The remainder is 7.

The mission lasted 12 days and 7 hours. Check to see if the exact answer is close to your estimated answer. Why is it important to estimate your answer before dividing?

**By comparing your answer to the estimate, you can check if your answer is reasonable.**

**Try Divide.**

- |                        |                        |
|------------------------|------------------------|
| a. $32\overline{)715}$ | b. $12\overline{)396}$ |
| c. $61\overline{)833}$ | d. $34\overline{)715}$ |

**Check**

$$\begin{array}{r} 24 \leftarrow \text{divisor} \\ \times 12 \leftarrow \text{quotient} \\ \hline 48 \\ 24 \phantom{0} \\ \hline 288 \\ + 7 \leftarrow \text{remainder} \\ \hline 295 \leftarrow \text{dividend} \end{array}$$



## Practice 100

Name: \_\_\_\_\_ P100

Divide

|                                      |                                       |                                      |
|--------------------------------------|---------------------------------------|--------------------------------------|
| 1. $26\overline{)599}$ <b>23 R1</b>  | 2. $15\overline{)1168}$ <b>11 R3</b>  | 3. $50\overline{)766}$ <b>15 R16</b> |
| 4. $33\overline{)699}$ <b>21 R6</b>  | 5. $42\overline{)896}$ <b>21 R14</b>  | 6. $51\overline{)871}$ <b>17 R4</b>  |
| 7. $21\overline{)764}$ <b>36 R8</b>  | 8. $12\overline{)288}$ <b>24</b>      | 9. $62\overline{)831}$ <b>13 R25</b> |
| 10. $47\overline{)988}$ <b>21 R1</b> | 11. $41\overline{)797}$ <b>19 R18</b> | 12. $56\overline{)784}$ <b>14</b>    |

Solve each problem.

13. Derek is going to decorate cars for a parade. He needs 410 meters of crepe paper. If each roll has 12 meters of crepe paper, how many rolls will he need?  
**35 rolls**

14. John has a stamp album with 930 stamps. The album has 62 pages with the same number of stamps on each page. How many stamps are on each page?  
**15 stamps**

## Reteaching 100

Name: \_\_\_\_\_ R100

Find  $685 \div 32$ .

$32\overline{)685}$

Write the 2 above the 8.

How many 32s in 68? 2

In 1930 there were millions of these on farms in the United States. What are they?

Divide. Copy the letters below.

|                          |                          |                                    |
|--------------------------|--------------------------|------------------------------------|
| 1. $21\overline{)252}$ S | 2. $21\overline{)441}$ D | 3. $21\overline{)449}$ <b>1 R8</b> |
| 4. $34\overline{)774}$ N | 5. $43\overline{)478}$ L | 6. $31\overline{)943}$ M           |
| 7. $25\overline{)50}$ W  | 8. $45\overline{)498}$ I | 9. $62\overline{)783}$ I           |

**W I N D M I L L S**

22 12 R39 11 21 32 R2 11 R3 21 R8 11 R5 12



## Practice Divide.

1.  $23 \overline{)496}$  **21 R13**
2.  $31 \overline{)992}$  **32**
3.  $68 \overline{)789}$  **11 R41**
4.  $55 \overline{)679}$  **12 R19**
5.  $47 \overline{)991}$  **21 R4**
6.  $21 \overline{)576}$  **27 R9**
7.  $58 \overline{)754}$  **13**
8.  $29 \overline{)349}$  **12 R1**
9.  $72 \overline{)976}$  **13 R40**
10.  $84 \overline{)927}$  **11 R3**
11.  $30 \overline{)742}$  **24 R22**
12.  $40 \overline{)756}$  **18 R36**
13.  $75 \overline{)900}$  **12**
14.  $83 \overline{)913}$  **11**
15.  $12 \overline{)498}$  **41 R6**
16.  $13 \overline{)288}$  **22 R2**
17.  $65 \overline{)780}$  **12**
18.  $90 \overline{)995}$  **11 R5**
19.  $24 \overline{)538}$  **22 R10**
20.  $32 \overline{)832}$  **26**

**Apply** Use data from a table. The table gives information about the Project Apollo missions. Solve each problem.

| Mission   | Length of mission |
|-----------|-------------------|
| Apollo 7  | 260 hours         |
| Apollo 8  | 147 hours         |
| Apollo 9  | 241 hours         |
| Apollo 10 | 192 hours         |
| Apollo 11 | 195 hours         |
| Apollo 12 | 245 hours         |
| Apollo 13 | 143 hours         |
| Apollo 14 | 216 hours         |
| Apollo 15 | 295 hours         |
| Apollo 16 | 266 hours         |
| Apollo 17 | 302 hours         |

Find the length of each mission in days and hours. Remember, there are 24 hours in a day.

21. Apollo 15 **12 days 7 hours**
22. Apollo 16 **11 days 2 hours**
23. Apollo 8 **6 days 3 hours**
24. Apollo 10 **8 days**
25. The Apollo 17 mission lasted how many hours longer than the Apollo 7 mission? **42 hours**
26. Astronaut Cernan was on Apollo 10 and Apollo 17. How many hours did he spend on these two missions? **494 hours**
27. Astronaut Lovell was on Apollo 8 and Apollo 13. How many hours did he spend on these two missions? **290 hours**

28. **Estimation** About how many days long was the Apollo 9 mission? Choose the best estimate.

1 day    10 days    100 days  
**10 days**

29. **Find the facts.** Can the students in your class form teams with the same number on each team and no students left over? How many students might be on each team? How many teams would there be? **Answers will vary.**

30. Let  $a$  be any number. Choose a number for  $b$  so that  $b$  is less than  $a$ . Put your numbers in the following sentences:

$$a \times b = b \times a \quad a \div b = b \div a$$

Are both of the sentences true? Explain why or why not. **See Using the Pages.**  
What happens in the sentences if  $b$  is zero?  
What can you say about the sentences when  $a$  and  $b$  are equal?

More Practice Set 100, page 387 **267**

## Assignment Guide

basic 1–15, 21–24, 28–29  
average 1–29  
enriched 1–30

**More Practice Set 100, page 387**

## Follow-Up

**Extra Practice** Using 518 as the dividend, have students guess which divisor—10, 20, 30, 40, or 50—will give the greatest remainder. [40] Then have them work each exercise to see how close their guesses were. [51 R8, 25 R18, 17 R8, 12 R38, 10 R18]

**Reteaching** Use pairs of exercises like those below to help students having difficulty.

1.  $22 \overline{)68}$  [3 R2]     $22 \overline{)685}$  [31 R3]
2.  $37 \overline{)38}$  [1 R1]     $37 \overline{)389}$  [10 R19]
3.  $41 \overline{)86}$  [2 R4]     $41 \overline{)861}$  [21]

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choices.

1.  $50 \times 6$  [300]
2.  $9,031 - 6,784$  [2,247]
3.  $63 \div 7$  [9]
4.  $3,097 + 23 + 145$  [3,265]
5.  $812 \div 3$  [270 R2]
6.  $630 \times 4$  [2,520]

## Daily Maintenance

**Estimation** Would you use grams or kilograms to measure the weight of

1. a pear? [Grams]
2. a tennis ball? [Grams]
3. a wagon? [Kilograms]
4. a kite? [Grams]
5. a desk? [Kilograms]
6. a bear? [Kilograms]

## Enrichment 100

Name \_\_\_\_\_ E100

**Help Me Find What I Need!**

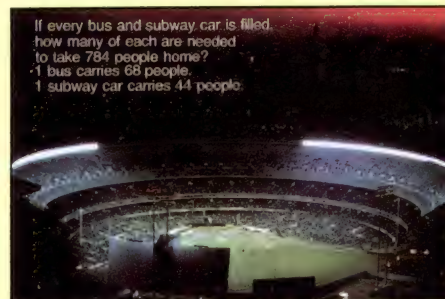
To help the ant find what he needs, find the numbers that are represented by the letters. Find each answer in the code below. Write the letter on the blank. The code uses one letter twice and does not use two of the letters.

1.  $21 \times A = 63$     A = 3
2.  $A \times R = 12$     R = 4
3.  $R \times C = 88$     C = 22
4.  $2 \times W = C$     W = 11
5.  $W \times E = C \times R$     E = 8
6.  $W \times M = (A \times C) \div W$     M = 7
7.  $N \times 2 = (W \times E) \div 2$     N = 45
8.  $W \times L = N \times W - 1$     L = 5
9.  $2 \times B = (L \times A) - A$     B = 6
10.  $C \times A = N - B$     O = 13

I need what was invented in 1968.

**L   W   N   M   O   W   E   R**  
5   3   11   45   7   13   8   4

## Additional Resource 100



### Math Poster KK Two-Digit Divisors

7 buses and 7 subway cars are needed to take 784 people home. Students should check that this is a reasonable answer by showing that 7 buses hold  $7 \times 68$ , or 476, people and that 7 subway cars hold  $7 \times 44$ , or 308, people. A total of  $476 + 308$ , or 784, people would be transported. See Answer Key for detailed solution.



## Using Problem-Solving Strategies

- Draw a diagram.
- List all possibilities.
- Use physical models.
- Find a pattern.

### Materials

- Basketball

### Introduction

Many students will draw a diagram to solve the first problem. As they solve other problems, they should notice patterns and use them to solve the remaining problems.

### Using the Pages

Encourage each group of students to discuss how they plan to solve the problem and to use more than one method if different members of the group have different ideas.

Students might begin by *drawing a diagram*, letting points represent the 6 team members and line segments represent the passes of the basketball.



Fifteen line segments means the ball was passed 15 times.

Others may give names to the team members and *list the possibilities* showing to whom each team member passes the ball.

|          |            |           |          |         |
|----------|------------|-----------|----------|---------|
| Sara to: | Sharon to: | Doris to: | Barb to: | Jan to: |
| Sharon   | Doris      | Barb      | Jan      | Ann     |
| Doris    | Barb       | Jan       | Ann      |         |
| Barb     | Jan        | Ann       |          |         |
| Jan      | Ann        |           |          |         |
| Ann      |            |           |          |         |

There are 15 passes.

After each group has solved Problems 1 and 2, discuss the methods used by the different groups. If no group suggests it, you might have students act out this problem *using a physical model*, a basketball. Have 6 students come to the front of the room and pass a basketball to one another. Have students do this one at a time, and ask the class to record how many passes each student makes.

|             |          |           |
|-------------|----------|-----------|
| 1st student | 5 passes |           |
| 2nd student | 4 passes | Total:    |
| 3rd student | 3 passes | 15 passes |
| 4th student | 2 passes |           |
| 5th student | 1 pass   |           |

The last student would make no additional passes since everyone has al-

## Using Problem-Solving Strategies

# A PASSING PUZZLE

There are 6 members on the Madison School basketball team. During a practice exercise, the basketball was passed between each pair of team members once. *How many times was the basketball passed?*



Get into a group with 3 other students. In your group, discuss how you think that you might solve this problem. If you have more than one idea, try to solve the problem in more than one way.

1. How many times was the basketball passed?  
**15 times**
2. How did you solve the problem? If other students in your group solved the problem in different ways, what methods did they use?  
**Answers will vary.**
3. What methods did students in other groups use? Compare the methods that your group used with the methods that other groups used.  
**Answers will vary.**

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ready passed the ball to him or her. Some students may *find a pattern* which will help them solve the remaining problems.

Encourage students to choose one of the methods discussed above to solve Problems 4 through 7.

Using a pattern, Problem 4 may be solved by recognizing that the first person would pass the ball to 7 people, the second person would pass to 6 people, and so on. To find the number of passes for 8 people, add the numbers 1 through 7.

$$7 + 6 + 5 + 4 + 3 + 2 + 1 = 28$$

Problem 5, which involves 12 players, would then be solved by adding the numbers 1 through 11.

$$11 + 10 + \dots + 3 + 2 + 1 = 66$$

For Problem 6, you can check students' addition by using the formula

$$P = \frac{n(n-1)}{2},$$

where  $n$  represents the number of students in your class and  $P$  represents the number of passes. For example, if you have 24 students in class, the ball would be passed 276 times.

$$P = \frac{n(n-1)}{2} = \frac{24(24-1)}{2} = \frac{24(23)}{2} = 276$$

For Problem 8, students may notice that the answer must be between 8 and 12 members since these teams produced 28 and 66 passes, respectively. If students try 10 members, they will find that

$$9 + 8 + 7 + \dots + 3 + 2 + 1 = 45.$$



## COMPUTER

## Assignment Guide

|          |     |
|----------|-----|
| basic    | 1–9 |
| average  | 1–9 |
| enriched | 1–9 |

### Computer

D is a letter that stands for the dividend. It stands for a location in the computer's memory where the value associated with D will be stored.

In Exercise 4, students can change line 20 without retyping the whole program. To do this, they should type 20 PRINT D/23. The new information will replace the old contents of line 20. They should type LIST to see the program with the changed line 20, and then type RUN to execute the program.

Students often forget to type RUN each time when using a program that contains INPUT. If they type the number they mean to input and then some other information, they will have altered the program. They should type LIST to find these errors. To eliminate a line that has been entered in this way, they should just type the line number and press the return or enter key. Then they should type LIST to see that the line no longer exists.

### Follow-Up

Your better students might want to consider Problem 9 with the numbers of students in the two lines being different. For example, you might ask, how many times would the basketball be passed if the 20 students were divided into lines of 5 students and 15 students? [150 times]

### Computer Assisted Instruction

Mathematics Courseware Series  
• Division 2, Activities 5, 6

### Daily Maintenance

Find the average of each group of numbers.

- 3, 7, 8 [6]
- 2, 9, 4 [5]
- 3, 8, 10, 15 [9]
- 15, 35, 20, 14 [21]
- 45, 52, 75, 84 [64]
- 118, 142, 163, 156, 186 [153]

Try to use one or more methods to solve the following problems.

- If there were 8 members on the basketball team, how many times would the basketball be passed?  
**28 times**
- If there were 12 members on the basketball team, how many times would the basketball be passed?  
**66 times**
- Suppose that a basketball was passed just once between every pair of students in your class. How many times would the basketball be passed?

**See Using the Pages.**

- Which method do you like the best? Why do you like this method the best?

**Answers will vary.**

- When a basketball was passed once between every pair of players on the team, the ball was passed a total of 45 times. How many members were on the team?

**10 members**

- A teacher divided his class of 20 students into 2 equal lines. Every student in class took a turn and passed the basketball to every student in the other line. How many times was the basketball passed after all the students had taken their turns passing?

**200 times**



### BASIC: INPUT Statements

In this program, an INPUT statement is used to enter the dividend (D). After the program is typed in, the computer reads it. When the computer reads INPUT, a ? appears on the screen and the computer waits for a number to be typed in.

```
10 INPUT D
20 PRINT D/3
30 END
```

When 12 is typed for D,  
this is printed.

```
?12
4
```

When 30 is typed for D,  
this is printed.

```
?30
10
```

Tell what would be printed for the program above when each of the following is typed for D.

- 42 **?42**  
**14**
- 57 **?57**  
**19**
- 96 **?96**  
**32**
- Tell what would be printed for the following program when 184 is typed for D.

```
10 INPUT D
20 PRINT D/23
30 END
```

Tell what would be printed for the program in Exercise 4 when each of the following is typed for D.

- 322 **?322**  
**14**
- 782 **?782**  
**34**
- 966 **?966**  
**42**

Problem 9 is different from the other problems because students pass the ball to each other a number of times. You might have 20 students form two equal lines and count how many times one student passes the ball. Repeat this with another student. Ask how many times every person will pass the ball. [10 times] Ask how many students there are in all. [20 students] Finally, ask how many times the ball will be passed after all the students take their turns. [200 times]



## Objective 101

Solve word problems by writing equations involving multiplication or division.

### Lesson Theme

Science: Speeds of Animals

### Introduction

**Motivational Situation** Pose the following problem to the students. Suppose you were a zoologist, how could you determine the speed of various animals? [Use a radar gun, use a stop watch to time how long it takes the animal to go from one designated point to another]

**Draw a picture** Ask students what operation they would need to use to find how far they could walk in 4 hours if they walked 2 miles per hour. [Multiplication] Draw this chart on the board.

| How far? |         |         |         |
|----------|---------|---------|---------|
| 2 miles  | 2 miles | 2 miles | 2 miles |
| 1 hour   | 1 hour  | 1 hour  | 1 hour  |

Have a student write an equation to show how to solve the problem.

[ $4 \times 2 = 8$ , 8 miles] Then ask the students what operation they would use to find the average speed if they rode in an automobile for 3 hours and traveled 150 miles. [Division] Draw this chart on the board.

| 150 miles |        |        |
|-----------|--------|--------|
| 1 hour    | 1 hour | 1 hour |

Have a student write an equation to show how to solve the problem.

[ $150 \div 3 = 50$ , 50 miles per hour]

### Using the Pages

**Teach** Read through the example with the class, emphasizing the five steps, especially the Plan step. Point out that writing an equation will help determine the operation needed to solve the problem.

**Try** Decide with the class which operation should be used with Exercises a [multiplication] and b [division].

**Apply Problem Solving** Have students discuss each problem before trying to solve it.

**Write a problem** Have students work in groups of four. Give them equations similar to these.

$$42 \div 7 = n, \quad 42 \times 7 = n$$

$$42 - 7 = n, \quad 42 + 7 = n$$

Have them write a problem for each equation.

### Problem Solving Write an Equation

- A.** Charlie the cheetah ran 78 miles in 2 hours. What was his average speed in miles per hour?

**Read** Facts: 78 miles, 2 hours  
Find: Average speed in miles per hour

**Plan** Think of Charlie running the same number of miles each hour. That number is the same as his average speed. Write an equation to show that the total number of miles separated into equal groups, one group for each hour, gives the average speed.

|                 |                 |                          |
|-----------------|-----------------|--------------------------|
| Number of miles | Number of hours | Number of miles per hour |
| 78              | 2               | $n$                      |

$$78 \div 2 = n$$

**Solve**

|       |                               |
|-------|-------------------------------|
| 39    | Estimate:<br>$80 \div 2 = 40$ |
| 2) 78 |                               |
| 6     |                               |
| 18    |                               |
| 18    |                               |
| 0     | $n = 39$                      |

**Answer** Charlie's average speed was 39 miles per hour.

**Look Back** If Charlie ran 39 miles per hour for 2 hours, then his total distance could be found by multiplying 39 by 2. Since  $2 \times 39 = 78$ , the answer is correct.

- B.** Katy the kangaroo moves a distance of about 8 feet per hop. About how far does she move in 15 hops?

|                  |                |                |
|------------------|----------------|----------------|
| Distance per hop | Number of hops | Total distance |
| 8                | 15             | $n$            |

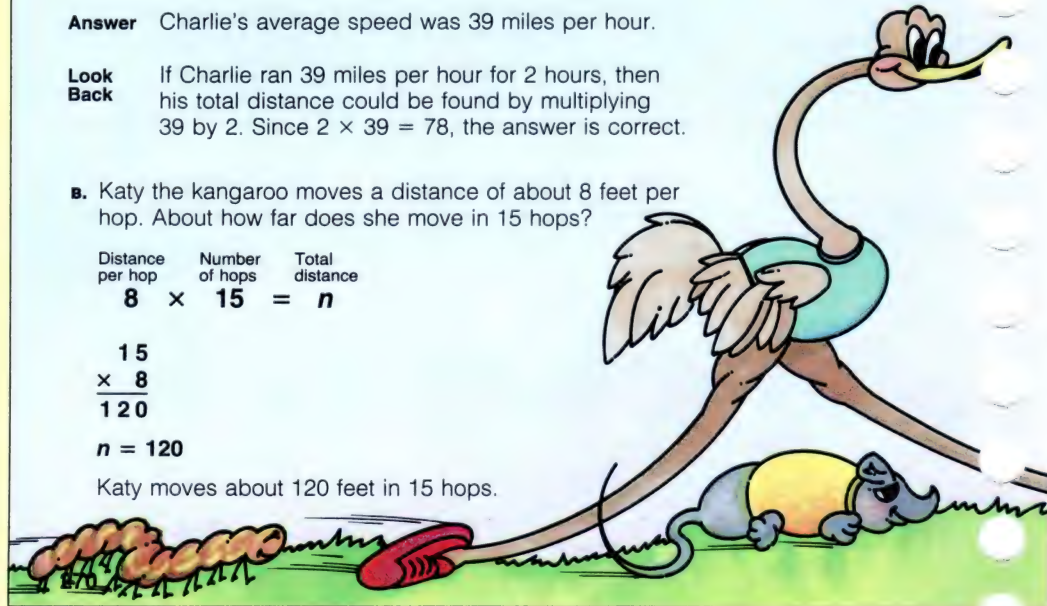
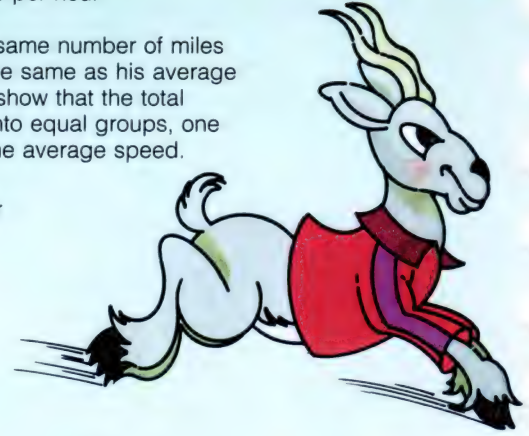
$$8 \times 15 = n$$

**Solve**

|            |
|------------|
| 15         |
| $\times 8$ |
| 120        |

$$n = 120$$

Katy moves about 120 feet in 15 hops.



### Practice 101

Name: \_\_\_\_\_ P101

Write an equation. Then give the answer.

- Marcy buys film with 24 pictures on a roll. How many rolls will she need to take 312 pictures?  
 $312 \div 24 = n$   
13 rolls
- Ann bought a package of flashcubes for \$1.50. There were 6 flashcubes in the package. What did each flashcube cost?  
 $\$1.50 \div 6 = n$   
\$0.25 each
- Audrey paid \$8.75 for 35 prints. How much did each print cost?  
 $\$8.75 \div 35 = n$   
\$0.25 each
- Ellen's photo album has 32 pages. Each page holds 6 pictures. How many pictures can she fit in her album?  
 $32 \times 6 = n$   
192 pictures
- A slide tray holds 40 slides. How many trays are needed for 600 slides?  
 $600 \div 40 = n$   
15 trays
- A slide tray holds 60 slides. How many slides can 35 trays hold?  
 $60 \times 35 = n$   
2,100 slides
- Susuma is saving to buy a camera. The price was \$239.50, but has gone up to \$27.49. What is the current price of the camera?  
 $\$239.50 + \$27.49 = n$   
\$266.99
- Roger wants to buy a camera that sells for \$75. He has \$56. How much more money does he need?  
 $\$75 - \$56 = n$   
\$19 more

### Reteaching 101

Name: \_\_\_\_\_ R101

A young emperor penguin weighs about 24 pounds. How much would 8 penguins weigh?

If I weighs 24 pounds, then 8 weigh 8 times that much.

Choose the operation. Write an equation. Find the answer.

Multiplication  $8 \times 24 = n$

8 penguins would weigh 192 pounds.

Circle the operation to use. Write an equation. Then find the answer.

- An adult emperor penguin weighs about 72 pounds. How much would 9 penguins weigh?  
 $9 \times 72 = n$  648 pounds
- 9 penguins ate 72 pounds of fish. How much did each penguin eat?  
 $72 \div 9 = n$  8 pounds
- Adelle penguins can walk 2 miles per hour. How long would it take to go 12 miles?  
 $12 \div 2 = n$  6 hours
- Adelle penguins can swim 15 miles per hour. How far could they swim in 4 hours?  
 $15 \times 4 = n$  60 miles
- A king penguin weighs about 36 pounds. How much do 12 king penguins weigh?  
 $36 \times 12 = n$  432 pounds
- A line of 4 fairy penguins swimming end to end reaches 60 inches. How tall is each fairy penguin?  
 $60 \div 4 = n$  15 inches



## Assignment Guide

|          |     |
|----------|-----|
| basic    | 1-6 |
| average  | 1-8 |
| enriched | 1-8 |

**More Practice Set 101,**  
page 388

## Follow-Up

**Reteaching** *Draw a picture* Have students draw diagrams or pictures to help them solve the problems.

**Enrichment** *Use data from outside the text* Have students research the speeds of animals such as a greyhound or an eagle and write their own problems about them.

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choices.

- $42 \div 6$  [7]
- $560 \div 7$  [80]
- $621 \div 3$  [207]
- $1,978 \div 5$  [395 R3]
- $320 \div 40$  [8]
- $243 \div 26$  [9 R9]
- $907 \div 81$  [11 R16]
- $768 \div 64$  [12]

## Cooperative Learning Groups

See page 482 of this Teacher's Edition.

**Try** Write an equation. Then find the answer.

- Bennie the butterfly can fly about 20 miles per hour. How far could he fly in 4 hours?  
 $20 \times 4 = n$  **80 miles**
- Hazel the honeybee flew 33 miles in 3 hours. What was her average speed in miles per hour?  
 $33 \div 3 = n$  **11 miles per hour**

**Apply** Write an equation. Then find the answer.

- Tony the trout swam 30 miles in 2 hours. What was his average speed in miles per hour?  
 $30 \div 2 = n$  **15 miles per hour**
- Molly the mole spent almost 8 hours traveling 328 feet. What was her average speed in feet per hour?  
 $328 \div 8 = n$  **41 feet per hour**
- Turk the tortoise can travel 15 feet per minute. Hattie the hare can travel 250 times as fast. How many feet per minute can Hattie travel?  
 $15 \times 250 = n$  **3,750 feet per minute**
- Oscar the ostrich runs at an average speed of 27 miles per hour. How long would it take him to run 135 miles?  
 $135 \div 27 = n$  **5 hours**
- Dolly the dolphin can swim 37 miles per hour. How far could she swim in 5 hours?  
 $37 \times 5 = n$  **185 miles**
- Sonny the snail ran a race in 124 minutes. How many hours and minutes is this?  
(60 minutes = 1 hour)  
 $124 \div 60 = n$  **2 hours 4 minutes**
- Abbie the antelope runs at an average speed of 53 miles per hour. How far could she run in 8 hours?  
 $53 \times 8 = n$  **424 miles**
- Cindy the centipede ran a race in 205 seconds. How many minutes and seconds is this?  
(60 seconds = 1 minute)  
 $205 \div 60 = n$  **3 minutes 25 seconds**



More Practice Set 101, page 388 271

## Enrichment 101

| Writing Equations   |   | E101 |
|---|---|------|
| Write an equation. Then find the answer.  |   |      |
| 1. Bill ran 880 yards each day for one week. What was the total number of yards he ran?<br>(7 days = 1 week)  | 2. Last year, April's mother drove her car 12,912 miles. What was her average number of miles per month?<br>(12 months = 1 year)                      |      |
| $880 \times 7 = t$<br>$t = 6,160$ <b>6,160 yards</b>  | $12,912 \div 12 = m$<br>$m = 1,076$ <b>1,076 miles</b>  |      |
| 3. The Courier is delivered to 6,408 homes by 72 carriers. What is the average number of papers each delivers?<br>$6,408 \div 72 = n$   | 4. Lila is a carrier for the Courier. She earned \$312.00 in 12 weeks. What was the average amount she earned per week?<br>$312 \div 12 = a$          |      |
| $n = 89$ <b>89 papers</b>   | $a = 26$ <b>\$26.00</b>   |      |
| 5. One week, April's mother bought gasoline 3 times. She paid \$16.35, \$12.80, and \$17.50. How much did she spend on gasoline that week?<br>$16.35 + 12.80 + 17.50 = d$             | 6. Last year, Lila's father drove his car 23,556 miles. What was the average number of miles per week?<br>(52 weeks = 1 year)<br>$23,556 \div 52 = k$ |      |
| $d = 46.65$ <b>\$46.65</b>  | $k = 453$ <b>453 miles</b>  |      |
| 7. Bill's family pays \$295.00 for their house each month. Howard's family pays \$329.00 each month. How much more per month does Howard's family pay than Bill's?<br>$329 - 295 = p$ | 8. How much does Bill's family pay on their house in 1 year?<br>(12 months = 1 year)<br>$295 \times 12 = y$   |      |
| $p = 34$ <b>\$34.00</b>   | $y = 3,540$ <b>\$3,540.00</b>   |      |

## Additional Resource 101

| Calculator   |  | Additional Resource |
|--|--|---------------------|
| Division Disguises   |  | 101                 |
| Use the clues to match the names and numbers.  |  |                     |
| 1. The numbers 108, 462, and 231 have named themselves Jo, Mo, and Flo.  |  |                     |
| Jo says, "I'm divisible by 7."<br>Mo says, "I'm divisible by 2, 3, and 7."<br>Flo says, "I'm not divisible by 7, but I'm divisible by 2."  |  |                     |
| Jo is <u>231</u> Mo is <u>462</u> Flo is <u>108</u>  |  |                     |
| 2. The numbers 264, 899, and 693 have named themselves Jack, Crack, and Mack.  |  |                     |
| Jack says, "I'm greater than Crack."<br>Crack says, "I'm divisible by 3 and 11, but not by 9."<br>Mack says, "I'm divisible by 9."   |  |                     |
| Jack is <u>899</u> Crack is <u>264</u> Mack is <u>693</u>  |  |                     |
| 3. The numbers 504, 399, 494, and 637 have named themselves Mary, Harry, Larry, and Barry.   |  |                     |
| Mary and Larry are divisible by 2.<br>Harry and Barry are divisible by 7.<br>Harry and Mary are divisible by 19.<br>Harry and Larry are divisible by 3.<br>Barry and Mary are divisible by 13. |  |                     |
| Mary is <u>494</u> Harry is <u>399</u> Larry is <u>504</u> Barry is <u>637</u>   |  |                     |

## Daily Maintenance

Write each number in standard form.

- Forty-three thousand, five hundred sixteen [43,516]
- Eight hundred seventy-one thousand, forty-nine [871,049]
- Twenty-three million, five hundred thirty thousand [23,530,000]
- Six million, fifteen thousand, two hundred nineteen [6,015,219]
- Nine hundred million, four [900,000,004]



## Chapter 9 Test

An acceptable score for each objective is suggested on the Chapter 9 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| 89        | 1, 2       | 242–243    |
| 90        | 3, 4       | 244–245    |
| 91        | 5, 6       | 246–247    |
| 92        | 7, 8       | 248–249    |
| 93        | 9, 10      | 250–251    |
| 94        | 11, 12     | 252–253    |
| 95        | 13, 14     | 256–257    |
| 96        | 15, 16     | 258–259    |
| 97        | 17, 18     | 260–261    |
| 98        | 19, 20     | 262–263    |
| 99        | 21, 22     | 264–265    |
| 100       | 23, 24     | 266–267    |
| 101       | 25, 26     | 270–271    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 26             | 100 | 19             | 73 |
| 25             | 96  | 18             | 69 |
| 24             | 92  | 17             | 65 |
| 23             | 88  | 16             | 62 |
| 22             | 85  | 15             | 58 |
| 21             | 81  | 14             | 54 |
| 20             | 77  | 13             | 50 |

### Additional Ideas for Evaluation

See pages 464–467.

### Record Forms

- Class Record Form
- Student Test Record Form
- Chapter 9 Form for Individualizing
- Cumulative Record Folder

## Chapter 9 Test

Divide.

- $3 \overline{)15}$
- $8 \overline{)11 \text{ R}5}$
- $5 \overline{)10 \text{ R}3}$
- $2 \overline{)40 \text{ R}1}$
- $4 \overline{)116 \text{ R}3}$
- $6 \overline{)166}$
- $7 \overline{)103}$
- $3 \overline{)200 \text{ R}1}$
- $9 \overline{)82}$
- $5 \overline{)9 \text{ R}4}$
- $9 \overline{)738}$
- $5 \overline{)49}$
- $\$3.60 \div 2$
- $\$0.48 \div 4$

Solve each problem.

- Karen needs 64 beads to make a necklace. The beads come in packages of 5. How many packages should Karen buy?  
**13 packages**
- A 7-inch piece of ribbon is needed to make a bow. How many bows can be made from 180 inches of ribbon?  
**25 bows**

Find the average of each group of numbers.

- 2, 7, 9
- 26, 37, 29, 42, 31

Divide.

- $20 \overline{)140}$
- $30 \overline{)275}$
- $48 \overline{)96}$
- $51 \overline{)115}$
- $27 \overline{)53}$
- $74 \overline{)568}$
- $64 \overline{)768}$
- $32 \overline{)845}$

Write an equation. Then find the answer.

- A jackrabbit can run 45 miles per hour. At this rate, how far can he run in 2 hours?  
 **$45 \times 2 = n$  90 miles**
- A bus traveled 162 miles in 3 hours. What was its average speed in miles per hour?  
 **$162 \div 3 = n$  54 miles per hour**

## Chapter 9 Letter Home

**Keeping You Posted**

In mathematics, we have been studying division exercises like the ones below. You might continue to review the division flashcards with your child. Also ask your child to use division to decide how many days it will take him or her to finish reading a certain book. The next chapter in our mathematics textbook covers decimals.

To: Family

Although it sits in the mud to cool down from the heat, what animal is really neat?

To find out, work each exercise. Then connect the dots in the order the answers are given.

- $25 \overline{)125}$
- $60 \overline{)1513}$
- $29 \overline{)189}$
- $53 \overline{)01}$
- $28 \overline{)1368}$
- $614 \overline{)80}$
- $276 \overline{)17}$
- $23 \overline{)198}$
- $514 \overline{)88}$
- $76 \overline{)1608}$
- $427 \overline{)68}$
- $216 \overline{)17}$

Start at 1 and connect the dots in the order the answers are given.

## Chapter 9 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

**Posttest Chapter 9**

Divide.

- $3 \overline{)27}$
- $8 \overline{)11 \text{ R}4}$
- $7 \overline{)10 \text{ R}3}$
- $2 \overline{)40 \text{ R}1}$
- $5 \overline{)112 \text{ R}2}$
- $6 \overline{)133}$
- $7 \overline{)106}$
- $8 \overline{)300 \text{ R}2}$
- $9 \overline{)92}$
- $9 \overline{)9 \text{ R}2}$
- $10 \overline{)33 \text{ R}20}$
- $12 \overline{)0.13}$

Solve each problem.

- Emily needs 74 beads to make a necklace. The beads come in packages of 6. How many packages should Emily buy?  
**13 packages**
- An 8-inch piece of ribbon is needed to make a bow. How many bows can be made from 180 inches of ribbon?  
**22 bows**

**Posttest Chapter 9**

Find the average of each group of numbers.

- 4, 5, 9
- 44, 53, 47, 61, 45

Divide.

- $40 \overline{)240}$
- $50 \overline{)215}$
- $45 \overline{)90}$
- $47 \overline{)117}$
- $21 \overline{)215}$
- $34 \overline{)192}$
- $49 \overline{)37}$
- $33 \overline{)803}$

Write an equation. Then find the answer.

- A jack rabbit can run 35 miles per hour. At this rate, how far could the rabbit run in 4 hours?  
 **$35 \times 4 = n$   $n = 140$  140 miles**
- A bus traveled 177 miles in 3 hours. What was its average speed in miles per hour?  
 **$177 \div 3 = n$   $n = 59$  59 miles per hour**



# CHALLENGE

## Divisibility, Even Numbers, and Odd Numbers

One number is **divisible** by another number if the remainder is zero when you divide.

Is 245 divisible by 5?

$$\begin{array}{r} 49 \\ 5 \overline{)245} \\ \underline{20} \phantom{0} \\ 45 \\ \underline{45} \\ 0 \end{array} \leftarrow \text{Remainder is zero}$$

245 is divisible by 5.

A number that is divisible by 2 is an **even number**.  
Some even numbers are 0, 2, 4, 6, 8, 10.

A number that is not divisible by 2 is an **odd number**.  
Some odd numbers are 1, 3, 5, 7, 9, 11.

Divide to find out if the first number is divisible by the second number. Write *yes* or *no*.

1. 72; 4

**Yes**

2. 63; 2

**No**

3. 92; 3

**No**

4. 75; 5

**Yes**

5. 84; 7

**Yes**

6. 416; 3

**No**

7. 385; 5

**Yes**

8. 576; 6

**Yes**

9. 395; 9

**No**

10. 504; 8

**Yes**

Tell whether each number is even or odd.

11. 25

**Odd**

12. 86

**Even**

13. 788

**Even**

14. 151

**Odd**

15. 283

**Odd**

16. 472

**Even**

17. 734

**Even**

18. 187

**Odd**

19. 950

**Even**

20. 429

**Odd**

21. If a number ends in 0, 2, 4, 6, or 8, is the number even, or is it odd?

**Even**

22. If a number ends in 1, 3, 5, 7, or 9, is the number even, or is it odd?

**Odd**

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## Challenge

**Find a pattern** Help students formulate the generalization that all even numbers are divisible by 2, and conversely, no odd numbers are divisible by 2. Ask students if they know any other ways to check for divisibility.

[Any number ending in 0 is divisible by 10; any number ending in 0 or 5 is divisible by 5; if the sum of the digits in a number is divisible by 3, the number is divisible by 3; if the sum of the digits in a number is divisible by 9, the number is divisible by 9; if the last two digits of a number are divisible by 4, the number is divisible by 4; if the last three digits of a number are divisible by 8, the number is divisible by 8; and if a number is divisible by both 2 and 3, it is divisible by 6.]

## Answers, page 247

13. Answers may vary. A sample is given. A remainder must be 0, 1, 2, or 3, when dividing by 4. Since there are 7 trees left over, distribute one more tree to each stack, leaving a remainder of 3 trees and 118 trees in each stack. Therefore,  $475 \div 4 = 118R3$ .

## Answers, page 259

7. To find the average of a set of numbers, add the numbers and then divide the sum by the number of numbers in the set.
8. 20    9. 28    10. 107    11. 200
12. One way to find an average using a calculator is to put each number in the set into memory and add successively by using the **M+** key. Then press **MR** and divide by the number of numbers in the set.
10. PRESS: 129 **M+** 132 **M+** 118 **M+** 100 **M+** 121 **M+** 42 **M+** **MR**  $\div$  6 **=**
11. PRESS: 198 **M+** 204 **M+** 216 **M+** 187 **M+** 195 **M+** **MR**  $\div$  5 **=**

13. No. Answers will vary. A sample is given. Age 18 is greater than any of the ages of students in elementary school. An average of a set of numbers cannot be greater than any of the numbers in the set.
14. Three of the numbers in the set are near 0. Three of the numbers are near 100. About halfway between 0 and 100 would be an average. 50 is a quick estimate for an average. The actual average is 51.
15. 24.5. This number cannot be the number of people in each play because there is no such thing as one half of a person.



## Using Problem-Solving Strategies

- Try and check.

### Introduction

To solve this problem, students must first find the average amount of money spent for each lunch. They then use *try and check* to find possible combinations of food ordered. Students will use addition, multiplication, and division.

### Using the Page

Have students read through the lesson. Be sure they understand that the identical meal was ordered for each lunch in Problems 1 and 2.

For Problem 1, students will find the average amount of money spent for each lunch [ $7.20 \div 4 = 1.80$ ; \$1.80 was spent for each lunch.]

To answer Problem 2, students use *try and check* to determine which food items were ordered. There are four different orders that each total \$1.80. [regular hamburger, juice, and ice cream; or regular hamburger and 2 milks; or 3 ice creams; or 2 milks and 2 juices]

For Problem 3, add the cost of 2 soup orders to the total amount of money spent for all lunches. [ $\$1.20 + \$7.20 = \$8.40$ ]

For Problem 4, first find the cost of 3 soup orders. [ $3 \times \$0.60 = \$1.80$ ] Add the cost of the soup to the total amount spent for all lunches. [ $\$1.80 + \$7.20 = \$9.00$ ] Then find the average for all the lunches. [ $\$9.00 \div 4 = \$2.25$ ; The average amount spent for lunches was \$2.25.]

### Follow-Up

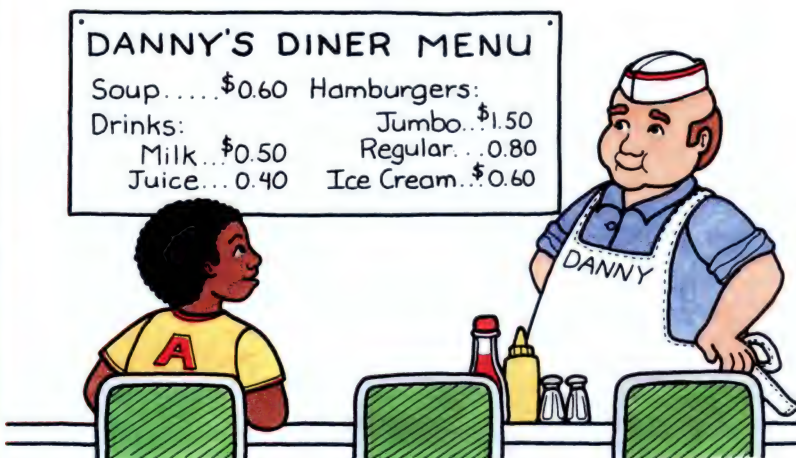
Use menus from local carry-out restaurants to make up similar problems involving food items and prices.

Students could exchange their problems with classmates to solve each other's lessons.

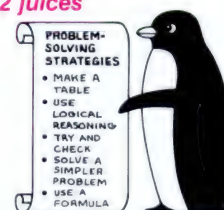
## Using Problem-Solving Strategies

# DANNY'S DINER

Andy ate lunch four times at Danny's Diner. He ordered the same meal for each of the 4 lunches, and he never ordered soup. Andy spent a total of \$7.20 for all the lunches. What did he order for each lunch?



1. What was the average amount of money Andy spent for each lunch? **\$1.80**
2. What did he order for lunch? **Answers may vary. Regular hamburger, juice, ice cream; 3 ice creams; regular hamburger, 2 milks; 2 milks, 2 juices**
3. If Andy had ordered soup with 2 lunches, what would be the total amount spent for all the lunches? **\$8.40**
4. How much would the daily average be for all the lunches if he ordered soup with 3 of his lunches? **\$2.25**



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 406



## Cumulative Test, Chapters 1–9

Give the letter for the correct answer.

1. Which number sentence is correct?

**A**  $45 > 39$       **C**  $45 > 52$   
**B**  $45 < 13$       **D**  $45 < 43$

2. Add.      **A** 19

**C**  $4 + 6 + 8$       **B** 16  
                          **C** 18  
                          **D** 21

3. Tell whether you *add* or *subtract*.

**D** Solve the problem.

A bird laid 7 eggs. Only 5 eggs hatched. How many eggs did not hatch?

**A** Add; 12 eggs  
**B** Add; 2 eggs  
**C** Subtract; 12 eggs  
**D** Subtract; 2 eggs

4. Give the standard form for

**A** five hundred thirty.

**A** 530      **C** 503  
**B** 305      **D** 350

5. Round 248 to the nearest

**B** hundred.

**A** 300      **C** 240  
**B** 200      **D** 250

6. Add.      **A** 954

**D**  $\begin{array}{r} 567 \\ + 487 \\ \hline \end{array}$       **B** 934  
                          **C** 1,034  
                          **D** 1,054

7. Add.

**C**  $\begin{array}{r} 36 \\ 18 \\ + 20 \\ \hline \end{array}$       **A** 64  
                          **B** 84  
                          **C** 74  
                          **D** 73

8. Subtract.

**B**  $\begin{array}{r} 734 \\ - 285 \\ \hline \end{array}$       **A** 559  
                          **B** 449  
                          **C** 549  
                          **D** 459

9. Subtract.

**D**  $\begin{array}{r} 800 \\ - 345 \\ \hline \end{array}$       **A** 545  
                          **B** 365  
                          **C** 355  
                          **D** 455

10. Choose the most sensible measure for the weight of a table.

**A** 60 pounds      **C** 6 ounces  
**B** 60 tons      **D** 6,000 pounds

11. Multiply.

**C**  $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$       **A** 11  
                          **B** 25  
                          **C** 30  
                          **D** 29

12. Multiply.

**A**  $\begin{array}{r} 153 \\ \times 3 \\ \hline \end{array}$       **A** 459  
                          **B** 359  
                          **C** 360  
                          **D** 460

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## Cumulative Test, Chapters 1–9

The following objectives are covered in this cumulative test. An asterisk preceding the number indicates that the objective is a target objective.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| * 2       | 1          | 4–5        |
| * 6       | 2          | 14–15      |
| * 7       | 3          | 16–17      |
| * 11      | 4          | 28–29      |
| * 14      | 5          | 34–35      |
| * 23      | 6          | 58–59      |
| * 24      | 7          | 60–61      |
| * 28      | 8          | 70–71      |
| 29        | 9          | 72–73      |
| 42        | 10         | 110–111    |
| * 52      | 11         | 138–139    |
| * 56      | 12         | 152–153    |
| * 59      | 13         | 158–159    |
| 71        | 14         | 192–193    |
| 72        | 15         | 194–195    |
| 74        | 16         | 200–201    |
| * 81      | 17         | 218–219    |
| * 85      | 18         | 228–229    |
| * 87      | 19         | 234–235    |
| * 88      | 20         | 236–237    |
| * 89      | 21         | 242–243    |
| 92        | 22         | 248–249    |
| 94        | 23         | 252–253    |
| 96        | 24         | 258–259    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 24             | 100 | 17             | 71 |
| 23             | 96  | 16             | 67 |
| 22             | 92  | 15             | 62 |
| 21             | 87  | 14             | 58 |
| 20             | 83  | 13             | 54 |
| 19             | 79  | 12             | 50 |
| 18             | 75  |                |    |

## Additional Ideas for Evaluation

See pages 464–467.

## Record Forms

- Class Test Record Form
- Student Test Record Form
- Cumulative Record Folder

## Cumulative Test, Chapters 1–9

Name \_\_\_\_\_

Circle the letter for the correct answer.

**Cumulative Test**  
Chapters 1–9

1. Which number sentence is correct?  
**A**  $82 < 98$       **C**  $82 < 81$   
**B**  $49 > 82$       **D**  $52 > 82$

2. Add.      **A** 21  
                          **B** 23  
                          **C** 19  
                          **D** 18

3. Tell whether you *add* or *subtract*.  
 Solve the problem.  
 A bird laid 8 eggs. Only 5 eggs hatched. How many eggs did not hatch?  
**A** Add; 13 eggs  
**B** Add; 3 eggs  
**C** Subtract; 13 eggs  
**D** Subtract; 3 eggs

4. What is seven hundred twenty in standard form?  
**A** 720      **C** 702  
**B** 207      **D** 270

5. Round 547 to the nearest hundred.  
**A** 600      **C** 540  
**B** 500      **D** 550

6. Add.      **A** 951  
                          **B** 961  
                          **C** 1,051  
                          **D** 1,061

7. Add.      **A** 72  
                          **B** 81  
                          **C** 82  
                          **D** 92

8. Subtract.      **A** 458  
                          **B** 348  
                          **C** 674  
                          **D** 358

9. Subtract.      **A** 626  
                          **B** 684  
                          **C** 674  
                          **D** 574

10. Choose the most sensible measure for the weight of a desk.  
**A** 50 pounds      **C** 50 ounces  
**B** 5 tons      **D** 5 pounds

11. Multiply.      **A** 24  
                          **B** 6  
                          **C** 27  
                          **D** 18


12. Multiply.      **A** 648  
                          **B** 448  
                          **C** 450  
                          **D** 650


13. Multiply.      **A** 2,509  
                          **B** 259  
                          **C** 314  
                          **D** 2,149


Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Cumulative Test**  
Ch. 1–9 (cont'd.)

14. What is the perimeter of the rectangle below?  
  
**A** 11 in.      **C** 7 in.  
**B** 14 in.      **D** 12 in.

15. Find the area of this figure in square centimeters.  
  
**A** 6 square centimeters  
**B** 4 square centimeters  
**C** 5 square centimeters  
**D** 8 square centimeters

16. Name a diameter of the circle.  
  
**A** Segment XY      **C** Segment XZ  
**B** Segment ZY      **D** Segment WY

17. Divide.      **A** 1  
                          **B** 6  
                          **C** 3  
                          **D** 0

18. Divide.      **A** 5  
                          **B** 9  
                          **C** 6  
                          **D** 8

19. Divide.      **A** 4 R6  
                          **B** 3 R7  
                          **C** 5 R2  
                          **D** 4 R5

20. Tell whether you *add*, *subtract*, *multiply*, or *divide*. Then find the answer.  
 Cara made a pattern with pebbles. She put 6 pebbles in each of 24 rows. How many pebbles did she use in all?  
**A** Divide; 4 pebbles  
**B** Add; 30 pebbles  
**C** Multiply; 144 pebbles  
**D** Subtract; 18 pebbles

21. Divide.      **A** 11 R2  
                          **B** 14 R4  
                          **C** 12 R5  
                          **D** 13 R3

22. Divide.      **A** 180 R3  
                          **B** 100 R4  
                          **C** 18  
                          **D** 108

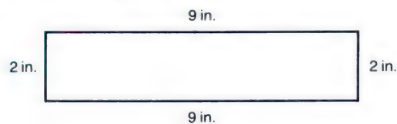
23. Divide.      **A** \$0.04  
                          **B** \$4.00  
                          **C** \$0.44  
                          **D** \$0.40

24. Find the average of 8, 6, 5, and 9.  
**A** 7      **C** 14  
**B** 28      **D** 9



13. Multiply. **A** 1,704  
**D**  $\begin{array}{r} 209 \\ \times 6 \\ \hline \end{array}$  **B** 174  
**C** 215  
**D** 1,254

14. What is the perimeter of the rectangle below?  
**B** rectangle below?



- A** 18 in. **C** 11 in.  
**B** 22 in. **D** 36 in.
15. Find the area of this figure in square centimeters.  
**B** centimeters.



- A** 4 square centimeters  
**B** 5 square centimeters  
**C** 10 square centimeters  
**D** 6 square centimeters
16. Which of the following is a diameter of the circle?  
**C** of the circle?



- A** Segment EF **C** Segment EG  
**B** Segment GF **D** Segment HF
17. Divide. **A** 1  
**D**  $0 \div 4$  **B** 4  
**C** 2  
**D** 0

18. Divide. **A** 17  
**C**  $9 \overline{)72}$  **B** 6  
**C** 8  
**D** 9

19. Divide. **A** 9 R4  
**A**  $6 \overline{)58}$  **B** 8 R5  
**C** 10 R2  
**D** 9 R3

20. Tell whether you *add*, *subtract*, *multiply*, or *divide*. Solve the problem.

Sybil made a pattern with pebbles. She put 8 pebbles in each of 32 rows. How many pebbles did she use in all?

- A** Divide; 4 pebbles  
**B** Add; 40 pebbles  
**C** Multiply; 256 pebbles  
**D** Subtract; 24 pebbles

21. Divide. **A** 9 R3  
**B**  $8 \overline{)97}$  **B** 12 R1  
**C** 10 R2  
**D** 11 R3

22. Divide. **A** 150 R2  
**D**  $7 \overline{)735}$  **B** 100 R5  
**C** 15  
**D** 105

23. Divide. **A** \$0.07  
**D**  $\$4.20 \div 6$  **B** \$7.00  
**C** \$0.77  
**D** \$0.70

24. Find the average of 7, 3, 6, and 8.  
**A** 6 **B** 24 **C** 18 **D** 7



## Mathematical Background

**Decimals** In many real-world situations, students encounter decimals. The groceries cost \$1.47, the car odometer records 527.3 miles, the track star runs the 100-meter race in 10.15 seconds, and a baseball hero is batting 0.345.

Although it is important to read decimal numbers correctly, it is equally important to understand that decimals use the same base-10 system used with whole numbers. Students should know the names of the places. For example, the number 0.23 should be read as "23 hundredths," but it should also be known that 10 *tenths* equal 1, and 10 *hundredths* equal one tenth.

Renaming with decimals is as useful as it is with whole numbers. Just as there are instances when "20" must be thought of as 20 ones or two tens, similarly 0.3 can be either 3 tenths, or 30 hundredths. When buying a notebook for \$0.60, this amount would usually not be thought of as 0.6 of a dollar (which would be 6 dimes), but rather as 60 hundredths of a dollar (60 cents). We say that the decimals 0.6 and 0.60 are equal.

Renaming is used when comparing decimals. Suppose Tom jumped 1.27 m, and Laura jumped 1.3 m. To determine who jumped higher, 1.3 should be changed to 1.30 so that the comparison can be made more easily.

**Addition and Subtraction** To add or subtract with decimals students should remember to retain the same number of decimal places when they rename numbers. For example, if we want to find the total height of the two high jumpers, then Laura's jump should be thought of as 1.30 m, and the sum would be 2.57 m.

## Contents

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## Pretest for Chapter 10

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 10**

Write each decimal.

1.  2. 

3. Seven tenths 4. Four and five tenths 5. Six hundredths 6. Five and sixty-three hundredths

Tell what the 2 means in each number.

7. 43.02 8. 12.3 9. 3.26

Write each amount with a dollar sign and a decimal point.

10. 73c 11. 19c 12. Five cents 13. Twenty cents

Compare the decimals. Use <, >, or =.

14. 3.81  $\circ$  3.84 15. 18.3  $\circ$  18.30 16. 37.2  $\circ$  37.1 17. 6.9  $\circ$  6.90

1. 0.3 2. 0.47 3. 0.7 4. 4.5 5. 0.06 6. 5.63

7. 2 hundredths 8. 2 ones 9. 2 tenths 10. \$0.73 11. \$0.19 12. \$0.05 13. \$0.20

14. < 15. = 16. > 17. =

19

Name \_\_\_\_\_

**Pretest Chapter 10**  
continued

Add

18.  $\begin{array}{r} 9.1 \\ + 3.9 \\ \hline \end{array}$  19.  $\begin{array}{r} 67.08 \\ + 5.33 \\ \hline \end{array}$  20.  $3.5 + 4.9$  21.  $0.2 + 14 + 3.6$

Subtract

22.  $\begin{array}{r} 51.3 \\ - 8.7 \\ \hline \end{array}$  23.  $\begin{array}{r} 7.02 \\ - 2.03 \\ \hline \end{array}$  24.  $\begin{array}{r} 37.5 \\ - 27.7 \\ \hline \end{array}$  25.  $37 - 14.51$  26.  $5.16 - 2$

Tell whether you should add or subtract. Then find the answer.

27. Ignacio spent \$4.76 for tapes and \$4.59 for a record. How much did he spend in all? 28. Louise ran 5 miles. Colleen ran 3.9 miles. How many more miles did Louise run than Colleen?

Solve each problem.

29. At Stu's hardware store, Kirk bought 7 gallons of paint, 6.8 feet of wide shelving, and 5.2 feet of narrow shelving. How many feet of shelving did he buy? 30. A rake weighs 1.4 pounds. A hose weighs 3.3 pounds. A sprinkler weighs 0.62 pounds. What is the difference in weight between a rake and a hose?

18. 13.0 19. 72.41 20. 8.4 21. 17.8

22. 42.6 23. 4.99 24. 9.8 25. 22.49 26. 3.16

27. Add, \$9.35 28. Subtract, 1.1 more miles

29. 12.0 feet 30. 1.9 pounds

20



# Teaching Chapter 10



## Problem Solving

**Five-Step Method** In previous chapters, students were informally introduced to problems in which too much information is given. In this chapter, students focus on the READ step as they take a more in-depth look at solving such problems. They will not only learn to identify the unnecessary information in the problem, but will solve the problem as well.

**Problem-Solving Strategies** The nonroutine problems in the *Using Problem-Solving Strategies* features on pages 294–295, 300, 428, and 429, give students opportunities to use other strategies, such as *Use physical models*, *Solve a simpler problem*, *Try and check*, *List all possibilities*, *Draw a diagram*, and *Work backward*.

It is a good idea to give students plenty of opportunity to compose their own problems. This will help them learn to deal with problems that provide too much or too little information. Creative activities of this nature also help make math time more personal for each student.



## Estimation and Mental Math

**Estimation** The lesson notes for this chapter suggest that students be encouraged to estimate decimal sums by adding only the *front-end digits*—ones digits. Because this method ignores the decimal portion, their estimates will always be low. If students are inclined to do all of the arithmetic instead of estimating, you might assign problems like the following:

$$\begin{array}{r} 6.2 \\ 3. \square \\ 5.2 \\ \hline ? \end{array}$$

A problem like this one must be estimated to be solved; without knowing the number in the box, it is impossible to complete the arithmetic.

The *Challenge* at the end of the chapter uses a number line to suggest a procedure for *rounding* decimals to the nearest whole number. You might have students discuss the options to determine which makes more sense. For example, will 30.8 be rounded to 30 or 31? Which makes more sense?



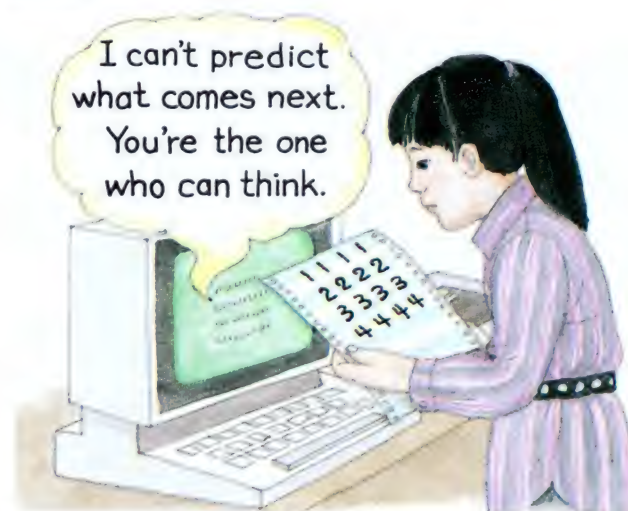
## Calculators and Computers

**Calculators** The following activity will help students understand decimals. Give each student a square that has been divided into tenths (Teaching Aid H). Have students enter .1  $\boxed{+}$   $\boxed{=}$  on their calculators, and show 0.1 on their diagrams by coloring the first region. Then have students press  $\boxed{=}$  again to count by 0.1 and color one more region, and continue in this fashion until they reach 0.9. At that time, ask students to predict what will be the next number. Students' responses will probably be numbers like 1.0 or 0.10. Next, have students count and color 0.1 more. They will see 1. on their calculators and a completed square. Students will have seen that ten tenths equals one.

Page 283 presents an excellent problem-solving activity using a calculator. Pretending that several calculator keys are broken, students attempt to perform computations without those keys. This encourages them to find other means of expressing a number.

**Computers** This chapter introduces looping, where a series of statements can be executed more than once, through the use of the GOTO statement. Students read programs that loop and attempt to predict their outcomes. Students can visualize looping by acting out the program. This will help them see how a GOTO statement shifts control to another part of the program.

**Additional Resource 110** introduces loops. Before students begin this worksheet, you may want to review the decision diamond in a flow chart (see **Additional Resource 71**). It is also a good idea to tell them, before they begin working, how to stop the computer if they find they have located an endless loop.



It is important to emphasize higher order thinking skills. Thinking skills will always be needed.



For a general overview of these topics, see pages 436–485.



## Concrete Materials

Decimals should be taught as an extension of what students already know about whole numbers. Tell students that tenths can be thought of as one of something cut up into ten parts, and hundredths as one of something cut up into one hundred parts. Students use Teaching Aid H to make decimal models that will show ones, tenths, and hundredths.

Students will notice that the bear on page 290 has a new shirt. The counters on the shirt depict decimal models. Let students describe the picture on the shirt. [1 one, 1 tenth, and 1 hundredth]

As additional aids, you might want to make the following items available for the class. A meter stick can be used to relate meters, decimeters, and centimeters to ones, tenths, and hundredths, especially if your students are familiar with the metric system. A  $10 \times 10$  piece of graph paper can be used in place of the decimal models mentioned in the lesson notes. A pegboard with one hundred pegs in a  $10 \times 10$  arrangement (each row representing one tenth, and each peg representing one hundredth) is also useful for decimal concepts, counting, and computation.

Finally, have students bring in illustrations of how decimals are used in everyday life. These examples could be stated in a student's own words, or come from articles clipped out of newspapers and magazines.



**Have students talk about what they are doing as they use concrete materials. In this way you can get an insight into their thinking processes.**



## Teaching Techniques

**Questioning and Responding** If students give wrong answers when they are working with decimals, try to respond in a way that does not show disappointment or rejection. Instead ask follow-up questions to determine whether the students are having trouble with basic facts, with the computational procedure, or just with the placement of the decimal point. As students explain what they did, they will clarify their own thinking.

**Helping Students Read and Write Mathematics** When students read decimals, point out that they can't simply read the number once from left to right. For example, to read 324.67 students can't say "three hundred . . ." until they have read the 2 and 4 as well as the 3. And they have to read both the 6 and 7 before they know to say "sixty-seven hundredths." When students write decimals, remind them to make the decimal point clearly visible.

**Teaching Students with Special Needs** Low achievers and special-education students may have trouble transferring their knowledge of whole numbers to their work with decimals. Show them the similarities repeatedly and provide lots of practice. Be aware that learning-disabled students may see decimal points in the wrong place or may overlook them entirely. Color highlighting will help. Using graph paper to help them line up the digits can also prove valuable.

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

**Health:** walkathon (280–281)

**Reading:** fantasy (288–289, 290–291)



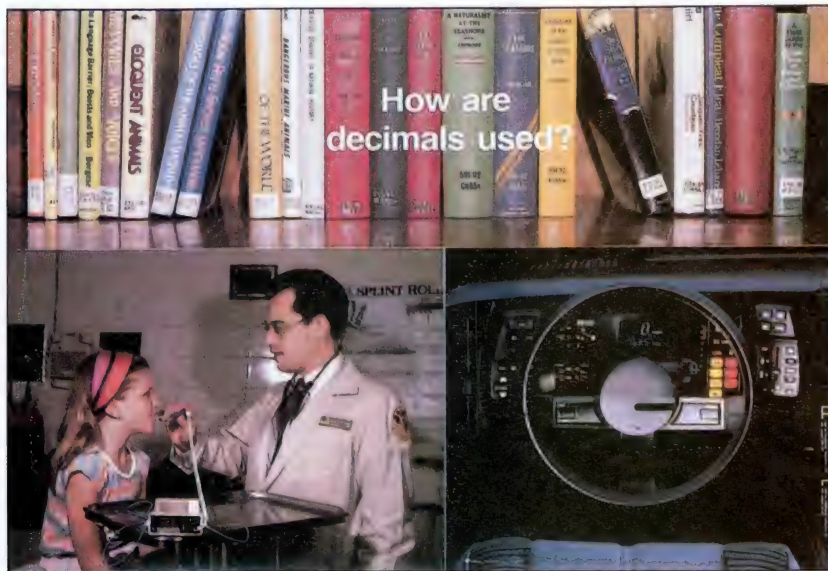
## Thinking Skills

**Comprehending concepts** is an important thinking skill in this chapter. Students learn place-value concepts for decimals and use those concepts as they **follow rules and procedures** for doing computation. Students **apply concepts** when they must *choose the operation* in problem solving. And students **analyze relationships** in the *Using Problem-Solving Strategies* features and in a lesson that focuses on solving problems with too much information. A good way to promote higher order thinking skills throughout the chapter is to have students look back to see whether their answers make sense and to have them explain how they arrived at those answers.

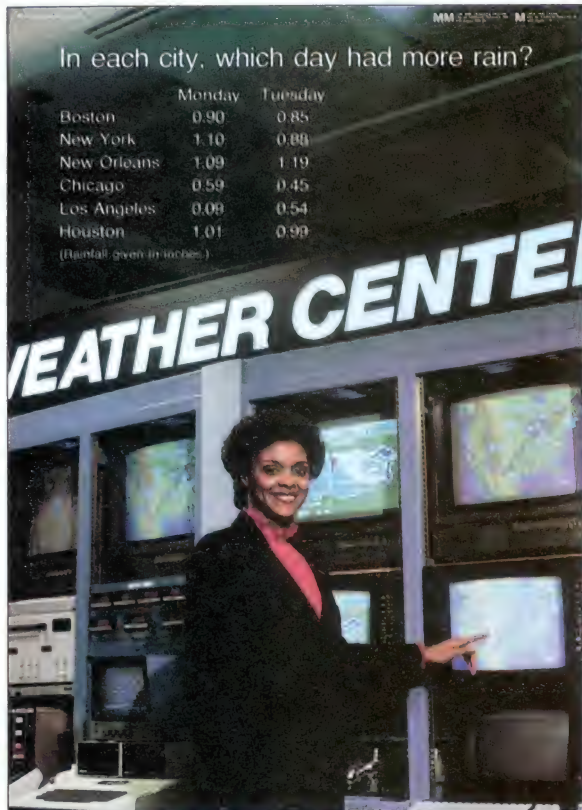


## Bulletin Board Suggestions

The posters shown here can be used with Chapter 10. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster LL



Math Poster MM

## Materials Chapter 10

- Decimal models (Teaching Aid H) 278–281, 286–291
- Place-value charts (Teaching Aid C) 278–281, 284–285, 288–289
- Cards 282–283
- Calculator 283–284
- Money (Punchouts) 284–285
- 40 cards 294–295



**Basic Situation**

Display Poster MM and use it to generate a discussion about weather and, in particular, the amount of rainfall. Then ask students to make a display that answers the question: "How does the amount of rainfall for the next month compare with the normal amount of rainfall for this time period?" It might be helpful to have students work in groups of 3 or 4 students.

**Possible Problems**

- How could information about the amount of rain that falls daily be gathered?
- How could this data be compared to the normal amount of rainfall?
- How could this information be organized and displayed?

**Indicators of Success**

Students may use various strategies to solve this problem. They might use information from newspapers, listen to news broadcasts, or use a rain gauge.

Students might organize their work by making tables, making lists containing the amount of rain received daily, or drawing graphs.

Students will need to compare the amount of rain that fell to the normal amount. Some students may subtract to find the difference, while others may determine if the actual amount is greater or less than the normal amount.

**Ways to Help**

If students have trouble deciding how to record the amounts of rainfall, you may want to suggest that the data be marked on a calendar.

Since rainfall is usually reported to the nearest hundredth of an inch, you may want to refer students to page 280 when recording hundredths, to page 286 when comparing hundredths, and to page 288 when adding hundredths.

Encourage students to use any reasonable technique to determine the amount of rainfall and stress that there are many good ways to solve this problem.



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

**Background Information**

The following information might be helpful. Rain is defined as a drop of water 0.02 inch in diameter. Light rain falls at a rate of 0.1 inches per hour, moderate rain is 0.11–0.3 inch per hour, and heavy rain is greater than 0.3 inch per hour.

The driest state:

Nevada—7.4 inches per year

The wettest state:

Hawaii—70 inches per year;

Mt. Waialeale has 460.0 inches per year.

Least rainfall in the U.S.:

Death Valley, California—

1.78 inches per year.

Greatest rainfall in the U.S.:

Yankeetown, Florida—In one 24-hour period 38.7 inches fell over an area of 10 square miles.

| City        | Annual Rainfall |
|-------------|-----------------|
| Boston      | 41.50 inches    |
| Chicago     | 33.47 inches    |
| Dallas      | 32.11 inches    |
| Los Angeles | 11.94 inches    |
| Mobile      | 63.26 inches    |
| New York    | 35.49 inches    |
| St. Louis   | 36.70 inches    |



## Objective 102

Write decimals involving tenths.

### Lesson Theme

Recreation: Cycling

### Vocabulary

Decimal, decimal point, tenth

### Materials

- Decimal Models (Teaching Aid H)
- Place-Value Charts (Teaching Aid C)

## Introduction

**Warm-Up Review** Write the following on the chalkboard. Then have students complete the exercises.

Write each number in standard form.

- 3 hundreds 4 tens 6 ones [346]
- 1 hundred 3 ones [103]
- seventy-two [72]
- nine hundred eleven [911]

Tell what the 4 means in each number.

- 847 [4 tens]
- 94 [4 ones]
- 481 [4 hundreds]

## Using the Pages

**Teach** Have students work through Example A. Point out the zero in the ones place. Explain to students that this means that there are no ones. Ask students to show the part of the square that represents the number of tenths shown on the cyclometer. Then read and discuss Example B. In Example C, stress that 2-3/10 is read two *and* three-tenths. Explain that the word *and* corresponds to the decimal point when reading decimals.

**Try** Encourage students to work together and discuss each decimal. For Exercises c–e, you might have students draw a picture of their decimal models after showing each decimal.

**Practice** In Exercise 7, be sure students understand how to represent 0 as a decimal and a fraction.

## Tenths

- A.** Turn over your hundred square so that the square is white. It represents 1 one.

Turn over your ten-sticks so that they look like white strips. Cover the square with the strips. How many strips cover the square? **10**

This shows you that 1 can be divided into 10 equal parts. Each part is called a tenth.

You can use place value and write a decimal for one tenth.

| ones | tenths |
|------|--------|
| 0    | 1      |

0.1  
↑  
Decimal point



A fraction with a denominator of 10 shows tenths. You can write this fraction for one tenth.

$$\frac{1}{10} \leftarrow \text{Denominator}$$

- B.** The cyclometer shows that the bicycle has been ridden 0.4 miles. Four tenths is 4 out of 10 equal parts.

| ones | tenths |
|------|--------|
| 0    | 4      |

Decimal 0.4

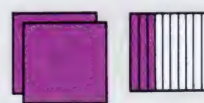
Fraction  $\frac{4}{10}$



- C.** This figure shows two and three tenths.

| ones | tenths |
|------|--------|
| 2    | 3      |

Decimal 2.3



Fraction  $2\frac{3}{10}$



## Practice 102

Name: \_\_\_\_\_

Write each decimal.

- 0.2
- 0.7
- 1.3
- 2.6
- 3.1
- Nine tenths  $\frac{9}{10}$
- Six tenths  $\frac{6}{10}$
- Four and three tenths  $4\frac{3}{10}$
- One tenth  $\frac{1}{10}$
- Ten and one tenth  $10\frac{1}{10}$
- Two and two tenths  $2\frac{2}{10}$
- Three and eight tenths  $3\frac{8}{10}$

Write each decimal in words.

- 5.7 Five and seven tenths
- 8.4 Eight and four tenths
- 0.3 Three tenths
- 9.6 Nine and six tenths
- 0.4 Four tenths
- 9.9 Nine and nine tenths

## Reteaching 102

Name: \_\_\_\_\_

**R102**

The shaded part is 1 whole

The shaded part is 1 tenth

The shaded part is 7 tenths

The shaded part is 2 and 5 tenths

1 one

0.1 one tenth

0.7 seven tenths

2.5 two and five tenths

The word tells you where to place the decimal point

Write each decimal.

- 0.2
- 0.7
- 1.3
- 2.6
- 3.1
- 0.9
- 0.6
- 4.3
- 0.1
- 10.1
- 2.2
- 3.8

Write each decimal in words.

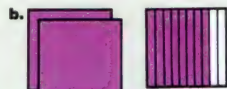
- 5.7 Five and seven tenths
- 8.4 Eight and four tenths
- 0.3 Three tenths
- 9.6 Nine and six tenths
- 0.4 Four tenths
- 9.9 Nine and nine tenths



**Try** Work in groups. Write each number as a decimal and as a fraction. Show the numbers in Exercises c–e with your decimal models.



0.2;  $\frac{2}{10}$



2.8;  $2\frac{8}{10}$

**See margin.**

c. seven tenths

0.7;  $\frac{7}{10}$

d. one and five tenths

1.5;  $1\frac{5}{10}$

e. three and one tenth

3.1;  $3\frac{1}{10}$

Write each number in words.

f. 0.3

Three tenths

g. 8.4

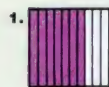
Eight and four tenths

h.  $2\frac{7}{10}$

Two and seven tenths

**Practice** Write each number as a decimal and as a fraction.

Show the numbers in Exercises 5–10 with your decimal models. **See margin.**



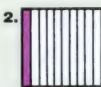
0.7;  $\frac{7}{10}$

5. five tenths

0.5;  $\frac{5}{10}$

8. four and one tenth

4.1;  $4\frac{1}{10}$



0.1;  $\frac{1}{10}$



1.9;  $1\frac{9}{10}$

6. eight tenths

0.8;  $\frac{8}{10}$

9. two and nine tenths

2.9;  $2\frac{9}{10}$



2.4;  $2\frac{4}{10}$

7. zero tenths

0.0;  $\frac{0}{10}$

10. one and six tenths

1.6;  $1\frac{6}{10}$

Write each number in words.

11. 0.7

Seven tenths

12. 5.2

Five and two tenths

13. 0.5

Five tenths

14. 3.9

Three and nine tenths

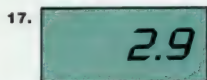
15. 9.1

Nine and one tenth

**Apply** Each cyclometer shows a decimal. Write the decimal in words.



Seven and six tenths



Two and nine tenths



Sixteen and four tenths

19. The odometer on a car shows the number of miles a car has been driven. The odometer on Mr. Davidson's car shows nine thousand two hundred thirteen and four tenths. Write the decimal for this number.

9,213.4

20. **Find the facts.** On most odometers, the digit at the right shows tenths. Find an odometer that shows tenths. Write the decimal for the number shown on this odometer.

Answers will vary.

Using Problem-Solving Strategies, page 428  
More Practice Set 102, page 388 279

## Assignment Guide

basic 1–19  
average 1–20  
enriched 1–20

**More Practice Set 102,**  
page 388

## Follow-Up

**Extra Practice** Read aloud decimals such as those that follow: 0.9, 5.2, 7.9. Have the students write each number.

**Reteaching** Have students make place-value charts and record the numbers before completing the exercises.

**Enrichment** Have students bring articles from newspapers or magazines that show decimals as they are used in real life. Make up a bulletin board in the classroom using the articles.

## Computer Assisted Instruction

Mathematics Courseware Series

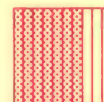
• Decimals 1, Activity 1

## Daily Maintenance

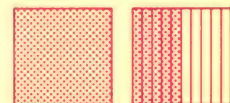
- 364 + 178 [542]
- 865 + 297 [1,162]
- 589 + 438 [1,027]
- 6,406 + 725 [7,131]
- 924 + 188 [1,112]

## Answers, page 279

c. 0.7



d. 1.5

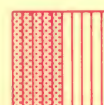


e. 3.1



5–10 A sample is given.

5. 0.5



**Using Problem-Solving**  
Strategies, page 428

## Enrichment 102

**Decimal Game** E102

This game is played with a deck of cards numbered 0.1 through 0.9 and a game strip for each player. Any number of people can play.

A player draws a card and shades the number of squares for the card on the game strip. The card is returned to the bottom of the deck. Players take turns until someone has shaded an entire game strip. That player is the winner.

Game strips

## Additional Resource 102

**Maintenance** Additional Resource 102

Add, subtract, multiply, or divide.

|                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 1. $8 \div 2 = 16$    | 2. $8 \div 2 = 10$    | 3. $8 \div 2 = 4$     |
| 4. $8 \div 2 = 6$     | 5. $9 \times 4 = 36$  | 6. $8 \times 7 = 56$  |
| 7. $24 \div 6 = 4$    | 8. $9 \div 7 = 16$    | 9. $48 \div 8 = 6$    |
| 10. $15 \div 8 = 7$   | 11. $16 \div 4 = 4$   | 12. $0 \div 9 = 0$    |
| 13. $5 \times 5 = 25$ | 14. $8 \times 5 = 40$ | 15. $16 \div 8 = 8$   |
| 16. $7 \div 1 = 7$    | 17. $7 \times 1 = 7$  | 18. $7 \div 7 = 14$   |
| 19. $8 \times 8 = 16$ | 20. $8 \times 8 = 64$ | 21. $8 \div 8 = 1$    |
| 22. $45 \div 9 = 5$   | 23. $5 \times 7 = 35$ | 24. $5 \div 7 = 12$   |
| 25. $3 \times 9 = 27$ | 26. $8 \times 3 = 24$ | 27. $24 \div 8 = 3$   |
| 28. $4 \times 9 = 36$ | 29. $42 \div 7 = 6$   | 30. $18 \div 9 = 9$   |
| 31. $18 \div 9 = 2$   | 32. $5 \div 5 = 1$    | 33. $54 \div 6 = 9$   |
| 34. $9 \times 9 = 81$ | 35. $28 \div 7 = 4$   | 36. $9 \times 3 = 27$ |
| 37. $49 \div 7 = 7$   | 38. $14 \div 7 = 2$   | 39. $14 \div 7 = 7$   |



## Objective 103 (Target Objective)

Write decimals involving tenths and hundredths.

### Lesson Theme

Health: Walkathon

### Vocabulary

Hundredths

### Materials

- Decimal Models (Teaching Aid H)
- Place-Value Charts (Teaching Aid C)

## Introduction

**Using Concrete Materials** Have students record 14.2 in a place value chart. Write on the board:

| tens | ones | tenths |
|------|------|--------|
| 1    | 4    | 2      |

Ask students what counters and decimal models they would use to show 14.2. [One ten-stick, four unit-squares, and two tenths strips]

Display 3 ten-sticks and 3 tenths strips. Ask what number the display represents. [30.3] Be sure students understand the difference between the tens place and the tenths place.

Ask students how to display 27.5. [Two ten-sticks, seven unit-squares, five tenths strips]

## Using the Pages

**Teach** After students work through Example A, have them work in groups to complete and discuss Example B. Ask students why the zero to the right of the decimal point in 0.08 is important. [It means that there are no tenths.] Ask them what would happen if the zero were not written. [The decimal would read eight tenths.]

In Example C, encourage students to discuss with their group members the relationship between tenths and hundredths. By covering 10 hundredths, students should realize that they are covering 1 tenth. Therefore they can generalize that 10 hundredths can be regrouped as 1 tenth.

Have students cover 70 hundredths on their models. Ask them to discuss what they notice about their models. [Seven tenths are covered which shows 70 hundredths can be regrouped as 7 tenths.]

**Practice Error Analysis** In Exercises 1, 9, and 11, watch for students who omit the zero in the tenths place. (See Reteaching 103.)

### Apply Problem Solving

**Calculator** In Problem 25, explain to students that the zero in front of the decimal is a way to remember that the number is less than 1.

## Hundredths

- A. Use a decimal model like this. The large square represents 1 one.



How many small squares make up the large square? **100**

When 1 one is divided into 100 equal parts, each part is 1 hundredth. Show 1 hundredth on your decimal model.

You can use a decimal or a fraction to show one hundredth.

| ones | tenths | hundredths |
|------|--------|------------|
| 0    | 0      | 1          |

Decimal 0.01

Fraction  $\frac{1}{100}$

A denominator of 100 shows hundredths.

- B. After one minute of walking, Andrea's pedometer showed eight hundredths mile. At the end of the walk, it showed two and ten hundredths miles.

Work in groups. Show each of these numbers using your decimal models.

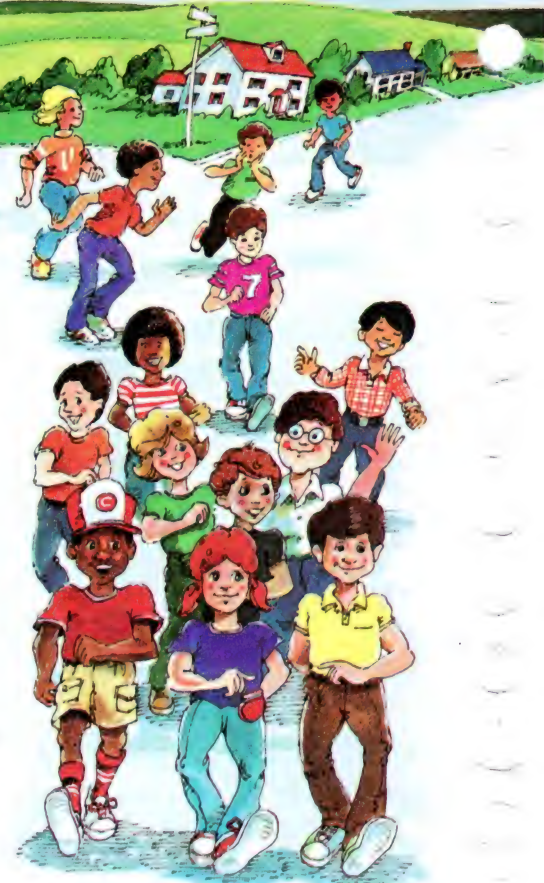
| ones | tenths | hundredths |
|------|--------|------------|
| 0    | 0      | 8          |

0.08  $\frac{8}{100}$

| ones | tenths | hundredths |
|------|--------|------------|
| 2    | 1      | 0          |

2.10  $2\frac{10}{100}$

280



- C. Continue to work in groups. Cover 10 hundredths on your decimal model. How many tenths are covered? Explain to someone how you can regroup 10 hundredths. Explain how you can regroup 70 hundredths.

See Using the Pages.

## Practice 103

Name \_\_\_\_\_

Write each decimal.

1. 0.07

2. 0.51

3. 0.16

4. 0.74

5. 1.35

6. 3.09

7. Three hundredths 0.03

8. Eleven hundredths 0.11

9. One hundredth 0.01

10. Eight hundredths 0.08

11. Six and twenty-seven hundredths 6.27

12. Three and forty-one hundredths 3.41

13. Ninety-nine hundredths 0.99

14. Two and fifteen hundredths 2.15

Write each decimal in words.

15. 0.56 Fifty-six hundredths

16. 0.07 Seven hundredths

17. 1.80 One and eighty hundredths

18. 3.85 Three and eighty-five hundredths

## Reteaching 103

Name \_\_\_\_\_

The shaded part is 1 tenth.

The shaded part is 1 hundredth.

The shaded part is 32 hundredths or 3 tenths and 2 hundredths.

ones tenths hundredths

0.1 one tenth

0.01 one hundredth

0.32 32 hundredths or 3 tenths and 2 hundredths

Write each decimal.

1. 0.26

2. 0.07

3. 1.09

4. 2.56

5. 0.07

6. 3.41

7. 63 hundredths 0.63

8. 47 hundredths 0.47

9. 9 and 78 hundredths 9.78

10. 5 and 3 hundredths 5.03

11. 6 hundredths 0.06

12. 8 hundredths 0.08



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–25 |
| average  | 1–25 |
| enriched | 1–25 |

**More Practice Set 103,  
page 388**

## Follow-Up

**Extra Practice** Have students use a meter stick to measure to the nearest centimeter various objects in the classroom. They should understand that a centimeter is equal to one-hundredth of a meter (1 cm = 0.01 m). Thus, they can obtain measurements such as 0.45 m and 1.67 m.

**Enrichment** Have students shade 0.2 on a hundredths square. Have them shade beside this 0.08. Have students complete the following expanded form equation by determining how many hundredths are shaded in all.

$$0.2 + 0.08 = [0.28]$$

Other examples:

$$0.4 + 0.03 = [0.43]$$

$$0.3 + 0.05 = [0.35]$$

## Computer Assisted Instruction

Mathematics Courseware Series

• Decimals 1, Activity 2

## Daily Maintenance

- $2 \times 501$  [1,002]
- $5 \times 670$  [3,350]
- $8 \times 3,009$  [24,072]
- $7 \times 5,701$  [39,907]
- $9 \times 8,200$  [73,800]

**Answers, page 281**



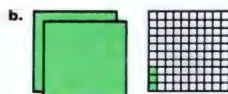
**Answers, page 281**

- sixty-three hundredths
- two hundredths
- six and eight hundredths
- twenty-nine hundredths
- one and forty hundredths
- seven and thirteen hundredths
- five and ten hundredths
- eighteen hundredths
- six and sixty hundredths
- seven hundredths

**Try** Work in groups. Write each number as a decimal and as a fraction.



0.20;  $\frac{20}{100}$



2.03;  $2\frac{3}{100}$

c. thirty-six hundredths

0.36;  $\frac{36}{100}$

d. forty-one hundredths

0.41;  $\frac{41}{100}$

e. sixty-seven and four hundredths

67.04;  $67\frac{4}{100}$

g. Write 5.26 in words.

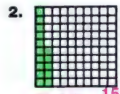
Five and twenty-six hundredths

f. Show forty hundredths with decimal models.  
**See margin.**

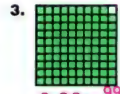
**Practice** Write each number as a decimal and as a fraction. Show the numbers in Exercises 7–12 with decimal models.



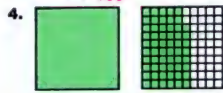
0.06;  $\frac{6}{100}$



0.15;  $\frac{15}{100}$



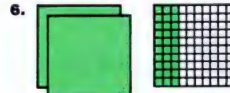
0.99;  $\frac{99}{100}$



1.58;  $1\frac{58}{100}$



3.08;  $3\frac{8}{100}$



2.30;  $2\frac{30}{100}$

7. seventy-five hundredths

0.75;  $\frac{75}{100}$

9. five hundredths

0.05;  $\frac{5}{100}$

11. four and four hundredths

4.04;  $4\frac{4}{100}$

8. two and thirty-one hundredths

2.31;  $2\frac{31}{100}$

10. eighty-nine hundredths

0.89;  $\frac{89}{100}$

12. twelve hundredths

0.12;  $\frac{12}{100}$

Write each decimal in words. **See margin.**

13. 0.63

14. 0.02

15. 6.08

16. 0.29

17. 1.40

18. 7.13

19. 5.10

20. 0.18

21. 6.60

22. 0.07

**Apply** Solve each problem.

23. Rita's pedometer showed that she had walked two and fourteen hundredths miles. Write this number as a decimal and as a fraction.

2.14;  $2\frac{14}{100}$

24. Dan's pedometer showed 5.06.

Write this number in words.

Five and six hundredths

25. **CALCULATOR** Display 0.36 on your calculator. Can you do this without pressing the 0 key?

Yes, on most calculators

More Practice Set 103, page 388 **281**

## Enrichment 103

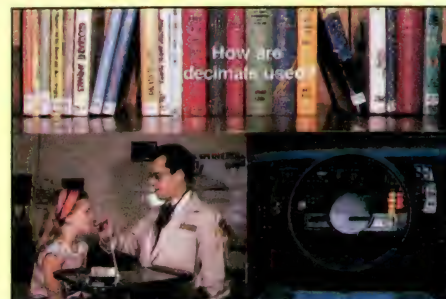
Name \_\_\_\_\_ E103

**Number Names**

Look at the numbers written below. Then answer each question.

- What number is named most often? 2.4
- What number is named least often? 1.4
- How many different numbers are named? 10

## Additional Resource 103



### Math Poster LL Using Decimals

Use this poster as a teaching display to help students recognize uses of decimals in everyday life. You could ask students to find other uses of decimals in everyday life in advertisements, articles, or other items that they find in newspapers or magazines. See Answer Key for other extensions.



## Objective 104 (Target Objective)

Write decimals and give the place value for any digit in decimals through hundredths.

### Lesson Theme

Careers: Meter Reader

### Materials

- Cards

## Introduction

**Warm-Up Review** On the board draw a place-value chart with column headings of hundreds through hundredths. Review the relationship between adjacent column headings by asking how many tens make 1 hundred [10], how many ones make 1 ten [10], how many tenths make one [10], and how many hundredths make 1 tenth [10]. Point out the symmetry of the places with respect to the ones place. (The tens and tenths are one place to the left and right, respectively, of the ones place; the hundreds and hundredths are two places to the left and right, respectively.)

## Using the Pages

**Teach** Read Example A and write the number in the place-value chart on the board, emphasizing the place value of each digit. Have students make a place-value chart for Example B. Then have students tell what each digit means in 931.72 and 784.59.

**Try Error Analysis** Watch for students who forget to put in a zero as a place-holder in Exercises g and h. Have these students use a place-value chart before writing the decimal. (See Re-teaching 104.)

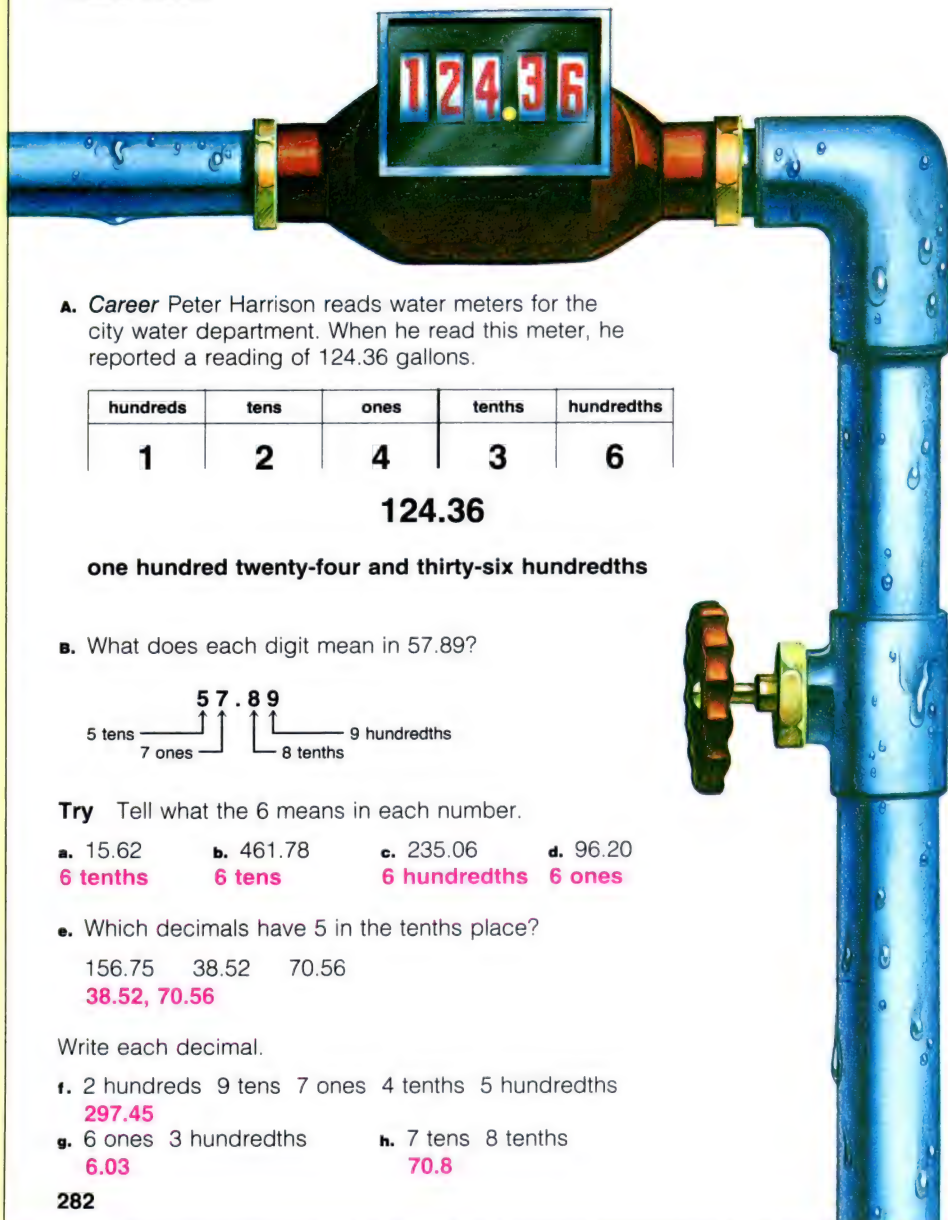
**Practice** Warn students that some of Exercises 11–14 may have more than one answer.

**Apply Problem Solving** Remind students to write a decimal point for the word *and*.

For Problem 21, suggest that students first find all the ways to arrange the numbers, ignoring the decimal point. [6 ways] Then have them determine the four different places where the decimal point may be placed. [Before the three digits, after the first digit, after the second digit, and at the end of the three digits.]

**Write a problem** Tell the students to make up their own meter readings and write them on paper. Then ask several students to read theirs to the class. Have a student write a decimal for each one on the board.

## Place Value



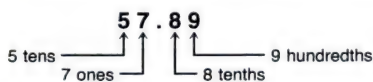
- A. **Career** Peter Harrison reads water meters for the city water department. When he read this meter, he reported a reading of 124.36 gallons.

| hundreds | tens | ones | tenths | hundredths |
|----------|------|------|--------|------------|
| 1        | 2    | 4    | 3      | 6          |

124.36

one hundred twenty-four and thirty-six hundredths

- B. What does each digit mean in 57.89?



**Try** Tell what the 6 means in each number.

- a. 15.62      b. 461.78      c. 235.06      d. 96.20  
6 tenths      6 tens      6 hundredths      6 ones

- e. Which decimals have 5 in the tenths place?

156.75    38.52    70.56  
38.52, 70.56

Write each decimal.

- f. 2 hundreds 9 tens 7 ones 4 tenths 5 hundredths  
297.45  
g. 6 ones 3 hundredths      h. 7 tens 8 tenths  
6.03      70.8

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## Practice 104

Name: \_\_\_\_\_

Write what the 6 means in each number.

|         |              |           |            |
|---------|--------------|-----------|------------|
| 1. 5.63 | 6 tenths     | 2. 36.78  | 6 ones     |
| 3. 0.96 | 6 hundredths | 4. 11.67  | 6 tenths   |
| 5. 0.36 | 6 hundredths | 6. 265.3  | 6 tens     |
| 7. 9.61 | 6 tenths     | 8. 632.57 | 6 hundreds |

Circle your answer in each exercise. Which decimals have

|                                |       |      |        |
|--------------------------------|-------|------|--------|
| 9. 4 in the tenths place?      | 4.67  | 0.64 | 9.45   |
| 10. 3 in the hundredths place? | 6.03  | 0.34 | 376.5  |
| 11. 0 in the tenths place?     | 9.70  | 8.05 | 90.65  |
| 12. 2 in the hundredths place? | 87.32 | 5.20 | 234.19 |

Write each decimal

|                             |        |
|-----------------------------|--------|
| 13. 1 ten 7 ones 9 tenths   | 17.9   |
| 14. 2 hundreds 4 hundredths | 200.04 |

For each problem, write the number as a decimal.

|   |       |
|---|-------|
| 15. The hare ran twelve and four hundredths miles.              | 12.04 |
| 16. The tortoise walked eight and thirty-four hundredths miles. | 8.34  |

## Reteaching 104

Name: \_\_\_\_\_

Tell what the 4 means in each number.

|          |      |      |        |            |
|----------|------|------|--------|------------|
| hundreds | tens | ones | tenths | hundredths |
| 2        | 4    | 7    | 3      | 4          |

This 4 is in the tens place. It means 4 tens.

This 4 is in the hundredths place. It means 4 hundredths.

Tell what the 8 means in each number.

|           |              |      |        |            |
|-----------|--------------|------|--------|------------|
| hundreds  | tens         | ones | tenths | hundredths |
| 1. 2      | 6            | 5    | 8      | 9          |
| 2. 4      | 8            | 3    | 7      | 1          |
| 3. 5      | 0            | 6    | 2      | 8          |
| 4. 7      | 9            | 8    | 4      | 6          |
| 5. 623.87 | 8 tenths     |      |        |            |
| 6. 841.20 | 8 hundreds   |      |        |            |
| 7. 300.48 | 8 hundredths |      |        |            |
| 8. 598.77 | 8 ones       |      |        |            |

Circle the decimals that have

|                               |      |       |        |        |       |        |
|-------------------------------|------|-------|--------|--------|-------|--------|
| 9. 5 in the tenths place      | 35.1 | 75.51 | 502.36 | 146.02 | 43.16 | 130.76 |
| 10. 6 in the hundredths place |      |       |        |        |       |        |

Write each decimal.

|   |        |
|---|--------|
| 11. 4 tens 3 ones 6 tenths                        | 43.6   |
| 12. 3 hundreds 4 tens 9 ones 1 tenth 8 hundredths | 349.18 |



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–20 |
| average  | 1–22 |
| enriched | 1–22 |

More Practice Set 104,  
page 389

### Calculator, page 283

**Use logical reasoning** Have the students copy the example on paper and circle the digits that are “broken.” Then go through the example pointing out that 4 ones can be expressed as 2 ones + 2 ones, and that 6 hundreds can be expressed as 3 hundreds + 3 hundreds.

### Follow-Up

**Reteaching** Have students make place-value charts before doing the exercises.

**Enrichment** Write out the words for decimals in mixed-up order as follows, and have students write the decimals correctly:

- 6 hundredths, 7 ones, 3 tens,  
2 hundreds, 9 tenths [237.96]
- 2 hundreds, 9 tenths, 5 tens,  
7 hundredths [250.97]
- 4 tens, 3 hundredths [40.03]

### Daily Maintenance

- 4,763 – 544 [4,219]
- 2,839 – 749 [2,090]
- 3,649 – 1,835 [1,814]
- 5,676 – 3,924 [1,752]
- 8,772 – 4,638 [4,134]

### Answers, page 283

- 24 ways  
.652, .625, .562, .526, .265, .256, 6.52, 6.25, 5.62, 5.26, 2.65, 2.56, 65.2, 62.5, 56.2, 52.6, 26.5, 25.6, 652., 625., 563., 526., 265., 256
- The numbers are the greatest when the decimal point is the fourth card. The numbers are the least when the decimal-point card is first.

### Calculator

- Press: 227  $+$  20  $+$  3,038  $+$  2,000  $=$   
Display: 5,285
- Press: 8,207  $+$  200  $+$  233  $+$  30  $=$   
Display: 8,670

Answers are continued on page 299 of this Teacher's Edition.

**Practice** Tell what the 7 means in each number.

- |                         |                         |                        |                      |                        |
|-------------------------|-------------------------|------------------------|----------------------|------------------------|
| 1. 21.79<br>7 tenths    | 2. 6.07<br>7 hundredths | 3. 257.3<br>7 ones     | 4. 76.94<br>7 tens   | 5. 702.5<br>7 hundreds |
| 6. 8.67<br>7 hundredths | 7. 370.25<br>7 tens     | 8. 741.9<br>7 hundreds | 9. 83.71<br>7 tenths | 10. 17.43<br>7 ones    |

Which decimals have

- |  |   |
|--|---|
| 11. 3 in the tenths place?<br>73.05 4.3 146.32<br>4.3, 146.32      | 12. 9 in the hundredths place?<br>1.09 946.27 38.95<br>1.09 |
| 13. 2 in the hundredths place?<br>15.72 236.48 3.92<br>15.72, 3.92 | 14. 8 in the tenths place?<br>4.08 134.87 18.32<br>134.87   |

Write each decimal.

- |  |  |
|--|--|
| 15. 8 ones 3 tenths 5 hundredths<br>8.35 | 16. 7 tens 6 ones 4 tenths<br>76.4       |
| 17. 4 hundreds 2 hundredths<br>400.02    | 18. 1 ten 6 tenths 8 hundredths<br>10.68 |

**Apply** Peter reported these water meter readings. Write each decimal.

- |  |  |
|--|--|
| 19. ninety-five and six hundredths gallons<br>95.06  | 20. five hundred twelve and thirty-four hundredths gallons<br>512.34   |
| 21. Write a decimal point, and the numbers 5, 2, and 6 on cards. How many different ways can the cards be arranged? Work with another student and list all the numbers.<br>See margin. | 22. Look at the list you wrote for Problem 21. Where is the decimal point when the numbers are greatest? Where is it when they are the least?<br>See margin. |

## Calculator

Pretend that the 4, 5, and 6 keys are broken on your calculator. Find the answers without using the 4, 5, and 6 keys. Write the keys you pressed.

734 + 608      Press: 732  $+$  2  $+$  308  $+$  300  $=$   
Display: 1342

Answers will vary. See margin for sample answers.

- |                |                |                    |
|----------------|----------------|--------------------|
| 1. 247 + 5,038 | 2. 8,407 + 263 | 3. 51 + 97,639     |
| 4. 6.1 + 925   | 5. 25.3 – 18.1 | *6. 28 $\times$ 53 |

More Practice Set 104, page 389 283

## Enrichment 104

Name: \_\_\_\_\_ E104

**Decimal Puzzles**

Use the clues to find the number described in each problem.

- The largest possible digit is in my tenths place. In my tens place is a digit 3 less than that. All my other digits are zeros.  
60.9
- The digit in my hundredths place is a 7. The digit in my ones place is a 2. My tenths digit is the difference of those. All my other digits are zeros.  
2.57
- Add 2 to my hundreds digit and you get my hundredths digit. My hundredths digit is 5 less than the largest possible digit. All my other digits are zeros.  
200.04
- Add my digits and divide by 2. You will get my ones digit which is 5. All my digits are zero except those in the ones and tenths places.  
5.5
- I have 7 ones and 1 hundredth. My tens digit is the average of these. All my other digits are zeros.  
47.01
- All my digits are nines or zeros. My non-zero digits are in the tens, tenths, and hundredths places.  
90.99
- I have 6 hundreds and 8 hundredths. All my other digits are zeros.  
600.08

## Additional Resource 104

Name: \_\_\_\_\_ Additional Resource 104

**Calculator Decimal Upside Downers**

When the calculator display 10345786 is turned upside down, you see forms of the letters gBLSHOEI.

Find each answer. Then turn your calculator upside down. Write the word you see.

- Enter 0.14.  
Add 4 ones.  
Subtract 9 hundredths.  
Subtract 6 tenths.  
Number 3.45 Word she
- Enter 90.83.  
Add 5 tenths.  
Subtract 3 tenths.  
Add 7 hundredths.  
Number 51.4 Word his
- Enter 27.61.  
Add 5 tenths.  
Subtract 7 hundredths.  
Add 9 ones.  
Number 37.04 Word hole
- Enter 467.61.  
Subtract 6 ones.  
Subtract 2 tenths.  
Add 9 hundredths.  
Add 6 ones.  
Number 461.5 Word sigh
- Enter 352.95.  
Subtract 3 hundreds.  
Add 4 tenths.  
Subtract 1 hundredth.  
Add 2 tens.  
Number 73.34 Word heel
- Enter 174.57.  
Add 2 hundreds.  
Subtract 5 tenths.  
Add 9 hundredths.  
Add 6 ones.  
Number 380.16 Word globe
- Enter 570.51.  
Subtract 2 tens.  
Add 6 hundredths.  
Subtract 5 tenths.  
Subtract 2 hundredths.  
Number 350.07 Word loose
- Enter 768.66.  
Add 3 ones.  
Add 5 thousands.  
Subtract 6 hundredths.  
Subtract 2 tenths.  
Number 5771.4 Word hills



## Objective 105

Write decimals for amounts of money.

### Lesson Theme

Consumer Topics: Shopping

### Materials

- Money (Punchouts)

### Introduction

**Motivational Situation** Discuss times students have gone shopping and spent less than one dollar. Ask for examples of items that might cost less than one dollar.

**Warm-Up Review** Review how many pennies in a dime, quarter, half-dollar, and dollar. Review the use of the cent sign and how it is used in designating amounts of money.

**Using Concrete Materials** Have students use place-value charts like the one below to relate dollars, dimes, and pennies to ones, tenths, and hundredths.

| (dollars) | (dimes) | (pennies)  |
|-----------|---------|------------|
| ones      | tenths  | hundredths |

Display 42 cents with money punchouts. Have students record this in a place-value chart and write the amount, using a dollar sign, and then using a cent sign. [\$0.42, 42¢] Have students display 4 cents, record this in a place-value chart, and then write the amount using a dollar sign and decimal point and using a cent sign. [\$0.04, 4¢] Repeat with 63 cents. [\$0.63, 63¢]

### Using the Pages

**Teach** *Reading and Writing Mathematics*

Read and discuss the example. Point out that both ways of writing 10 cents, for example, indicate 10 hundredths of a dollar.

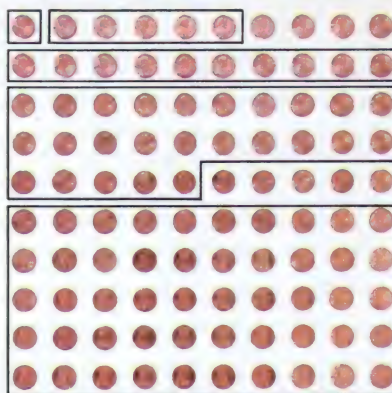
**Try** *Error Analysis* In Exercise a, watch for students who omit the zero needed as a placeholder in the tenths place. Have students use a place-value chart to illustrate the necessity of the zero.

**Practice** You may want students to read each of Exercises 1–17 as hundredths of a dollar. For example, Exercise 12 would be read as “62 hundredths of a dollar.”

**Apply** *Problem Solving* Encourage students to write a zero to the left of the decimal point when recording the amount of money in Problem 18.

## Money as Hundredths

Jim has 100 cents, or 1 dollar, to spend.



|                           |        |     |
|---------------------------|--------|-----|
| 1 hundredth of a dollar   | \$0.01 | 1¢  |
| 5 hundredths of a dollar  | \$0.05 | 5¢  |
| 10 hundredths of a dollar | \$0.10 | 10¢ |
| 25 hundredths of a dollar | \$0.25 | 25¢ |
| 50 hundredths of a dollar | \$0.50 | 50¢ |

**Try** Write each amount with a dollar sign and a decimal point.

- a. 6¢ **\$0.06**    b. 75¢ **\$0.75**    c. sixteen cents **\$0.16**

Write each amount with a cent sign.

- d. \$0.98 **98¢**    e. \$0.03 **3¢**    f. \$0.42 **42¢**



## Practice 105

Name \_\_\_\_\_ P105

Complete the table.

| Amount in words   | Amount with a cent sign | Amount with a dollar sign and a decimal point |
|-------------------|-------------------------|---|
| Nine cents        | 9¢                      | \$0.09  |
| Thirty cents      | 30¢                     | \$0.30  |
| Fifteen cents     | 15¢                     | \$0.15  |
| Fifty cents       | 50¢                     | \$0.50  |
| Ninety-nine cents | 99¢                     | \$0.99  |
| One cent          | 1¢                      | \$0.01  |
| Eighteen cents    | 18¢                     | \$0.18  |
| Six cents         | 6¢                      | \$0.06  |
| Eighty cents      | 80¢                     | \$0.80  |
| Eleven cents      | 11¢                     | \$0.11  |

Write each amount with a cent sign.

1. **89¢**    2. **7¢**    3. **35¢**

Solve each problem.

1. Laurie received one dollar and fifty-seven cents change. Write this amount with a dollar sign and a decimal point. **\$1.57**

2. Leon received four dollars and seven cents change. Write this amount with a dollar sign and a decimal point. **\$4.07**

## Reteaching 105

Name \_\_\_\_\_ R105

You can write money with a dollar sign and a decimal point. You can also write money with a cent sign.

\$0.01 = 1¢    \$0.25 = 25¢  
\$0.05 = 5¢    \$0.50 = 50¢  
\$0.10 = 10¢    \$1.00 = 100¢

Draw lines to connect equal amounts.

Write each amount with a dollar sign and a decimal point.

1. 29¢ **\$0.29**    2. 81¢ **\$0.81**    3. 13¢ **\$0.13**  
4. 6¢ **\$0.06**    5. 99¢ **\$0.99**    6. 54¢ **\$0.54**

Write each amount with a cent sign.

7. \$0.75 **75¢**    8. \$0.31 **31¢**    9. \$0.62 **62¢**  
10. \$0.09 **9¢**    11. \$0.48 **48¢**    12. \$0.88 **88¢**



## Assignment Guide

|          |          |
|----------|----------|
| basic    | 1–17, 20 |
| average  | 1–20     |
| enriched | 1–22     |

**More Practice Set 105,  
page 389**

### Maintenance, page 285

These exercises review addition and subtraction computation, providing readiness for addition and subtraction of decimals in lessons that follow.

### Follow-Up

#### Extra Practice *Reading and Writing*

**Mathematics** Ask students to write several sentences including amounts of money. Use a dollar sign and decimal point to record each amount. [Example: I spent \$0.33 at the fun fair.]

**Reteaching** You may want to have students solve exercises not previously assigned or solved incorrectly by using a place-value chart.

**Enrichment** Students can draw pictures of a shop window showing various items with price tags on them, with all prices less than one dollar. Students can write any one price with either the dollar sign and decimal point or with the cent sign.

#### Reading and Writing Mathematics

Write the following decimals on the board. Have students write them using only words: 7.37 [seven and thirty-seven hundredths], 6.4 [six and four tenths], 0.9 [nine tenths], 5.22 [five and twenty-two hundredths].

### Daily Maintenance

Solve each problem.

- Sarah had \$20.00. She bought a record for \$7.21. How much did Sarah have left? [\$12.79]
- Mrs. Sanchez spent \$6.24 for 4 hamburgers. How much did each hamburger cost? [\$1.56]
- Nick bought 3 cassette tapes. Each cost \$9.34. How much did he spend? [\$28.02]
- Kiri bought a hot dog for \$1.25, a drink for \$0.55, and an apple for \$0.75. How much did he spend in all? [\$2.55]

**Practice** Write each amount with a dollar sign and a decimal point.

- |                                 |                                    |                                 |                                      |
|---------------------------------|------------------------------------|---------------------------------|--------------------------------------|
| 1. 8¢<br><b>\$0.08</b>          | 2. 63¢<br><b>\$0.63</b>            | 3. 14¢<br><b>\$0.14</b>         | 4. 27¢<br><b>\$0.27</b>              |
| 5. 56 cents<br><b>\$0.56</b>    | 6. 2 cents<br><b>\$0.02</b>        | 7. 12 cents<br><b>\$0.12</b>    | 8. 86 cents<br><b>\$0.86</b>         |
| 9. forty cents<br><b>\$0.40</b> | 10. fifteen cents<br><b>\$0.15</b> | 11. nine cents<br><b>\$0.09</b> | 12. sixty-two cents<br><b>\$0.62</b> |


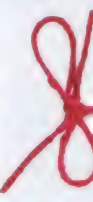

Write each amount with a cent sign.

- |                          |                          |                         |                          |                          |
|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|
| 13. \$0.79<br><b>79¢</b> | 14. \$0.20<br><b>20¢</b> | 15. \$0.07<br><b>7¢</b> | 16. \$0.81<br><b>81¢</b> | 17. \$0.99<br><b>99¢</b> |
|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|

**Apply** Solve each problem.

- Jim received twenty-one cents in change. Write this amount with a dollar sign and a decimal point.  
**\$0.21**
- Estimation** Carlotta spent \$12.37 at the market. Tell whether you think this amount is exact or estimated.  
**Exact**

Write each amount with a cent sign.

- |   |  |   |
|---|--|---|
| 20.  <b>\$0.95</b><br><b>95¢</b> | 21.  <b>\$0.04</b><br><b>4¢</b> | 22.  <b>\$0.45</b><br><b>45¢</b> |
|---|--|---|

## MAINTENANCE

Find each answer.

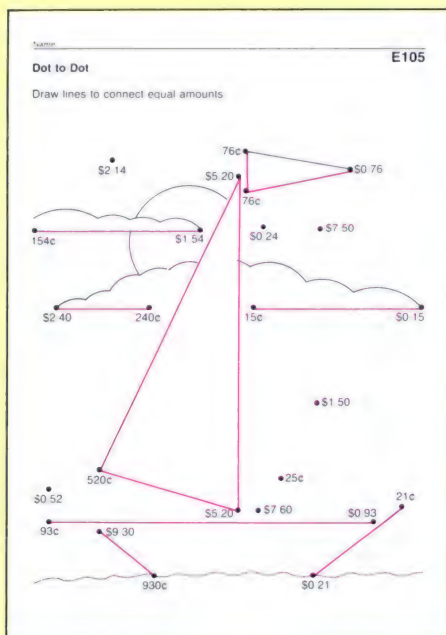
- |   |  |  |  |  |
|---|--|--|--|--|
| 1. $\begin{array}{r} 49 \\ + 26 \\ \hline 75 \end{array}$           | 2. $\begin{array}{r} 386 \\ + 129 \\ \hline 515 \end{array}$       | 3. $\begin{array}{r} 910 \\ - 165 \\ \hline 745 \end{array}$       | 4. $\begin{array}{r} 8,319 \\ - 2,576 \\ \hline 5,743 \end{array}$ | 5. $\begin{array}{r} 45 \\ \times 63 \\ \hline 2,835 \end{array}$    |
| 6. $\begin{array}{r} 304 \\ \times 75 \\ \hline 22,800 \end{array}$ | 7. $\begin{array}{r} 5,602 \\ - 3,415 \\ \hline 2,187 \end{array}$ | 8. $\begin{array}{r} 4,612 \\ + 1,835 \\ \hline 6,447 \end{array}$ | 9. $\begin{array}{r} 218 \\ \times 39 \\ \hline 8,502 \end{array}$ | 10. $\begin{array}{r} 462 \\ \times 47 \\ \hline 21,714 \end{array}$ |

More Practice Set 105, page 389 **285**

## Enrichment 105

**Dot to Dot** E105

Draw lines to connect equal amounts.



## Additional Resource 105

**Mental Math Money Matters** Additional Resource 105

What is the total cost?

$\$0.42$   
 $\$0.25$

That's  $42 + 20 = 62$  and  $62 + 5 = 67$ . The answer is \$0.67.

Add mentally to find the total cost.

|                                       |                                       |
|---------------------------------------|---------------------------------------|
| 1. $\$0.37 + \$0.20 =$ <b>\$0.57</b>  | 2. $\$0.37 + \$0.22 =$ <b>\$0.59</b>  |
| 3. $\$0.43 + \$0.50 =$ <b>\$0.93</b>  | 4. $\$0.43 + \$0.52 =$ <b>\$0.95</b>  |
| 5. $\$0.26 + \$0.40 =$ <b>\$0.66</b>  | 6. $\$0.26 + \$0.43 =$ <b>\$0.69</b>  |
| 7. $\$0.23 + \$0.50 =$ <b>\$0.73</b>  | 8. $\$0.23 + \$0.53 =$ <b>\$0.76</b>  |
| 9. $\$1.22 + \$0.60 =$ <b>\$1.82</b>  | 10. $\$1.22 + \$0.67 =$ <b>\$1.89</b> |
| 11. $\$2.15 + \$0.40 =$ <b>\$2.55</b> | 12. $\$2.15 + \$0.44 =$ <b>\$2.59</b> |
| 13. $\$4.35 + \$0.20 =$ <b>\$4.55</b> | 14. $\$4.35 + \$0.23 =$ <b>\$4.58</b> |
| 15. $\$4.15 + \$3.00 =$ <b>\$7.15</b> | 16. $\$2.13 + \$4.00 =$ <b>\$6.13</b> |
| 17. $\$5.15 + \$2.12 =$ <b>\$7.27</b> | 18. $\$4.25 + \$3.50 =$ <b>\$7.75</b> |



## Objective 106

Compare decimals through hundredths.

### Vocabulary

Equal decimals

### Materials

- Decimal Models (Teaching Aid H)

## Introduction

**Warm-Up Review** Review the meaning of the symbols  $<$  and  $>$  using whole numbers. Ask students to compare 842 and 826. Ask how they determined that 842 is greater than 826. [The hundreds places have the same digit, so compare digits in tens places.  $4 > 2$ , so  $842 > 826$ .] Also, use examples like 632 and 637 and 278 and 312. [ $632 < 637$ ,  $278 < 312$ ]

**Using Concrete Materials** Have students use decimal models to shade 0.5 on a tenths square and 0.50 on a hundredths square. Ask students which area is larger. [They are the same.] Write on the board  $0.5 = 0.50$ . Have students shade decimal models to compare 0.03 and 0.07, 0.4 and 0.2, 0.2 and 0.20, 0.3 and 0.5, and 0.08 and 0.05. [ $0.03 < 0.07$ ,  $0.4 > 0.2$ ,  $0.2 = 0.20$ ,  $0.3 < 0.5$ ,  $0.08 > 0.05$ ]

## Using the Pages

**Teach** In Example A, remind students that numbers on the number line are ordered with the greater number always appearing to the right of the lesser number. In Example B, emphasize that  $0.07 > 0.05$  can also be read as  $0.05 < 0.07$ . Example C uses the same procedure to compare decimals that was used to compare whole numbers.

**Try Error Analysis** Watch for students who use the symbols  $<$  and  $>$  incorrectly. Remind students that the larger end of the symbol faces the greater number. (See Reteaching 106.)

**Practice Error Analysis** In Exercises 21–23 and 27, watch for students who think the decimals are equal because the same digits are used. Have these students shade decimal models to reinforce the value of each digit.

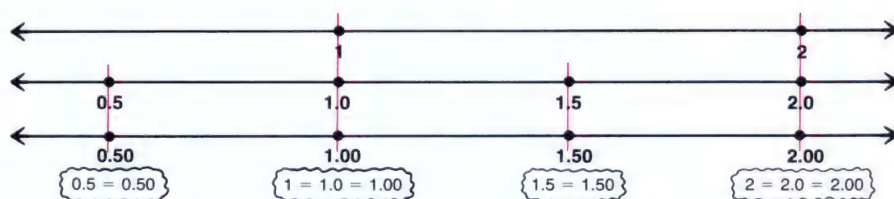
### Apply Problem Solving

**Calculator** In Problem 30, explain that calculators drop ending zeros behind the decimal point because they do not change the value of the answer. Point out that students should show zeros in the hundredths place when problems involve money. Caution students that zeros acting as placeholders in numbers like 2.07 are important and cannot be dropped.

(Continued on page 287.)

## Comparing Decimals

- A. The number line shows some *equal decimals*.



- B. Write two number sentences to compare 0.07 and 0.05.



7 hundredths is greater than 5 hundredths.

$$0.07 > 0.05$$

5 hundredths is less than 7 hundredths.

$$0.05 < 0.07$$

- C. Compare the decimals. Use  $<$ ,  $>$ , or  $=$ .

$$26.3 \text{ } \bullet \text{ } 26.4$$

$$26.3 \text{ } \bullet \text{ } 26.4 \quad \text{The tens are the same.}$$

$$26.3 \text{ } \bullet \text{ } 26.4 \quad \text{The ones are the same.}$$

$$26.3 \text{ } \bullet \text{ } 26.4 \quad \text{3 tenths is less than 4 tenths.}$$

$$26.3 \text{ is less than } 26.4.$$

$$26.3 < 26.4$$

**Try** Write an equal decimal for

- a. 0.6 in hundredths.

$$0.60$$

- b. 3.90 in tenths.

$$3.9$$

Write two number sentences to compare the decimals. Use  $<$  and  $>$ .



$$0.6 < 0.9, 0.9 > 0.6$$



$$0.29 < 0.35, 0.35 > 0.29$$

Compare the decimals. Use  $<$ ,  $>$ , or  $=$ .

e.  $6.51 \text{ } \bullet \text{ } 6.38$

$$>$$

f.  $2.7 \text{ } \bullet \text{ } 2.70$

$$=$$

g.  $17.52 \text{ } \bullet \text{ } 18.25$

$$<$$

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## Practice 106

Name \_\_\_\_\_

Write an equal decimal for

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. 2.5 in hundredths. <u>2.50</u> | 2. 6.80 in tenths. <u>6.8</u>     |
| 3. 0.9 in hundredths. <u>0.90</u> | 4. 32.30 in tenths. <u>32.3</u>   |
| 5. 24.80 in tenths. <u>24.8</u>   | 6. 0.70 in tenths. <u>0.7</u>     |
| 7. 19.20 in tenths. <u>19.2</u>   | 8. 6.4 in hundredths. <u>6.40</u> |

Compare the decimals in the figures at the right.

Use  $<$ ,  $>$ , or  $=$ .

If the answer is  $<$ , color the shape red.

If the answer is  $>$ , color the shape blue.

If the answer is  $=$ , color the shape yellow.

## Reteaching 106

Name \_\_\_\_\_

Write a decimal to show how much is shaded. Compare the decimals. Use  $<$ ,  $>$ , or  $=$ .

|                       |                       |                            |               |               |              |
|-----------------------|-----------------------|----------------------------|---------------|---------------|--------------|
| 2 tenths              | 5 tenths              | 8 tenths                   | 80 hundredths | 17 hundredths | 6 hundredths |
|                       |                       |                            |               |               |              |
| 0.2 is less than 0.5. | 0.8 is equal to 0.80. | 0.17 is greater than 0.06. |               |               |              |
| $0.2 < 0.5$           | $0.8 = 0.80$          | $0.17 > 0.06$              |               |               |              |

Write a decimal to show how much is shaded. Compare the decimals. Use  $<$ ,  $>$ , or  $=$ .

|  |   |  |
|--|---|--|
| 1. $0.6 \text{ } \bullet \text{ } 0.2$   | 2. $0.4 \text{ } \bullet \text{ } 0.9$  | 3. $0.5 \text{ } \bullet \text{ } 0.50$  |
| 4. $0.36 \text{ } \bullet \text{ } 0.57$ | 5. $0.40 \text{ } \bullet \text{ } 0.4$ | 6. $0.21 \text{ } \bullet \text{ } 0.28$ |
| 7. $0.08 \text{ } \bullet \text{ } 0.19$ | 8. $0.8 \text{ } \bullet \text{ } 0.3$  | 9. $0.70 \text{ } \bullet \text{ } 0.7$  |

Compare the decimals. Use  $<$ ,  $>$ , or  $=$ .

|  |   |   |
|--|---|---|
| 10. $0.4 \text{ } \bullet \text{ } 0.1$  | 11. $0.5 \text{ } \bullet \text{ } 0.9$   | 12. $3.7 \text{ } \bullet \text{ } 3.8$   |
| 13. $0.6 \text{ } \bullet \text{ } 0.60$ | 14. $0.84 \text{ } \bullet \text{ } 0.89$ | 15. $0.11 \text{ } \bullet \text{ } 0.01$ |
| 16. $9.30 \text{ } \bullet \text{ } 9.3$ | 17. $4.75 \text{ } \bullet \text{ } 4.73$ | 18. $4.75 \text{ } \bullet \text{ } 4.85$ |



**Practice** Write an equal decimal for

1. 1.3 in hundredths.  
**1.30**
2. 0.20 in tenths.  
**0.2**
3. 0.5 in hundredths.  
**0.50**
4. 28.90 in tenths.  
**28.9**
5. 14.7 in hundredths.  
**14.70**
6. 10.60 in tenths.  
**10.6**

Write two number sentences to compare the decimals. Use  $<$  and  $>$ .

7.   
 **$0.2 < 0.3$**   
 **$0.3 > 0.2$**
8.   
 **$0.21 < 0.27$**   
 **$0.27 > 0.21$**
9.   
 **$0.7 < 0.9$**   
 **$0.9 > 0.7$**
10.   
 **$0.68 < 0.86$**   
 **$0.86 > 0.68$**
11.   
 **$0.4 < 0.8$**   
 **$0.8 > 0.4$**
12.   
 **$0.44 < 0.61$**   
 **$0.61 > 0.44$**

Compare the decimals. Use  $<$ ,  $>$ , or  $=$ .

13.  $0.6 \bullet 0.7$   
 **$<$**
14.  $4.3 \bullet 4.5$   
 **$<$**
15.  $0.8 \bullet 0.80$   
 **$=$**
16.  $0.45 \bullet 0.29$   
 **$>$**
17.  $16.30 \bullet 16.3$   
 **$=$**
18.  $9.16 \bullet 9.19$   
 **$<$**
19.  $76.2 \bullet 74.2$   
 **$>$**
20.  $26.53 \bullet 26.51$   
 **$>$**
21.  $0.10 \bullet 0.01$   
 **$>$**
22.  $0.32 \bullet 0.23$   
 **$>$**
23.  $5.07 \bullet 5.70$   
 **$<$**
24.  $99.33 \bullet 96.36$   
 **$>$**
25.  $50.9 \bullet 50.50$   
 **$>$**
26.  $4.86 \bullet 4.80$   
 **$>$**
27.  $12.05 \bullet 21.50$   
 **$<$**

**Apply** Solve each problem.

28. Miyoshi weighed 70.5 pounds. Aiko weighed 75.1 pounds. Who weighed less?  
**Miyoshi**
29. Lee spent \$3.39 for tapes. Paul spent \$3.43 for tapes. Who spent less?  
**Lee**
30. **Calculator** Find  $\$4.50 + \$8.70$  on your calculator. What happens when you press  $+$  and  $=$ ? How is the sum displayed? **Zeros in the hundredths place not used. 13.2**
31. I was a three-digit number with digits all the same. When multiplied by one of my digits 1,776 I became. What number was I?  
**444**

More Practice Set 106, page 389 **287**

## Assignment Guide

|          |                  |
|----------|------------------|
| basic    | 1–21, 28, 30–31  |
| average  | 1–28 even, 29–31 |
| enriched | 1–6, 13–31       |

**More Practice Set 106, page 389**

(Continued from page 286.)

**Try and check** For Problem 31, encourage students to make a guess and check to see if it satisfies the conditions of the problem. If students find that a guess is incorrect, they will also know whether the guess is too high or too low. Encourage students to keep track of each guess and whether it was too high or too low, so that the solution can be found more efficiently.

## Follow-Up

**Extra Practice** In the following decimals, have students tell which decimal place shows the first number in each pair that is less than or greater than the second.

1. 0.36    0.56 [tenths]
2. 21.3    52.6 [tens]
3. 3.27    3.29 [hundredths]
4. 4.23    5.17 [ones]

## Reteaching Using Concrete Materials

For Exercises 1–6, have students shade decimal models to assist in finding equal decimals. For Exercises 13–27, have students write the two numbers to be compared in one place-value chart. Have students compare digits from greatest to least place value.

## Enrichment Using Concrete Materials

Have students shade decimal models to compare decimals such as 0.2 and 0.14. [ $0.2 > 0.14$ ] Ask how they can use the fact that  $0.2 = 0.20$  to help in determining this. Repeat with 0.4 and 0.23 and 0.3 and 0.27. [ $0.4 > 0.23$ ,  $0.3 > 0.27$ ]

## Cooperative Learning Groups

See page 483 of this Teacher's Edition.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Decimals 1, Activity 3

## Daily Maintenance

Give the standard form.

1. 8 tens 11 ones [91]
2. 13 tens 6 ones [136]
3. 5 tens 0 ones [50]
4. 9 tens 15 ones [105]
5. 7 tens 19 ones [89]

## Enrichment 106

Name: \_\_\_\_\_ E106

**The World's Longest Railroad Bridge**

Use the clues to find the location of the world's longest railroad bridge.

1. If  $3.27 \div 2.99$ , write **A** above the 4
2. If  $172.8 \div 404.2$ , write **T** above the 7
3. If  $0.6 \div 0.60$ , write **M** above the 5
4. If  $9.86 \div 9.99$ , write **I** above the 7
5. If  $0.43 \div 0.31$ , write **U** above the 9
6. If  $0.571 \div 0.183$ , write **A** above the 2
7. If  $0.50 \div 5.00$ , write **R** above the 6
8. If  $0.34 \div 0.47$ , write **M** above the 1
9. If  $4.0 \div 4.00$ , write **E** above the 10
10. If  $0.84 \div 1.95$ , write **C** above the 8
11. If  $2.64 \div 2.58$ , write **O** above the 2
12. If  $5.8 \div 5.3$ , write **Y** above the 3
13. If  $2 \div 2.00$ , write **B** above the 6
14. If  $9.14 \div 3.27$ , write **Q** above the 8
15. If  $2.7 \div 2.700$ , write **Z** above the 3

**M O Z A M B I Q U E**

1 2 3 4 5 6 7 8 9 10

## Additional Resource 106



## Math Poster MM Comparing

**Decimals** Boston, New York, Chicago, and Houston had more rain on Monday. New Orleans and Los Angeles had more rain on Tuesday.



## Objective 107

Add decimals through hundredths.

### Lesson Theme

Reading: Fantasy

### Materials

- Decimal Models (Teaching Aid H)

## Introduction

**Warm-Up Review** Review addition of whole numbers using the following exercises involving renaming:

$$9 + 27 [36] \quad 76 + 18 [94]$$

$$1,752 + 6,431 [8,183]$$

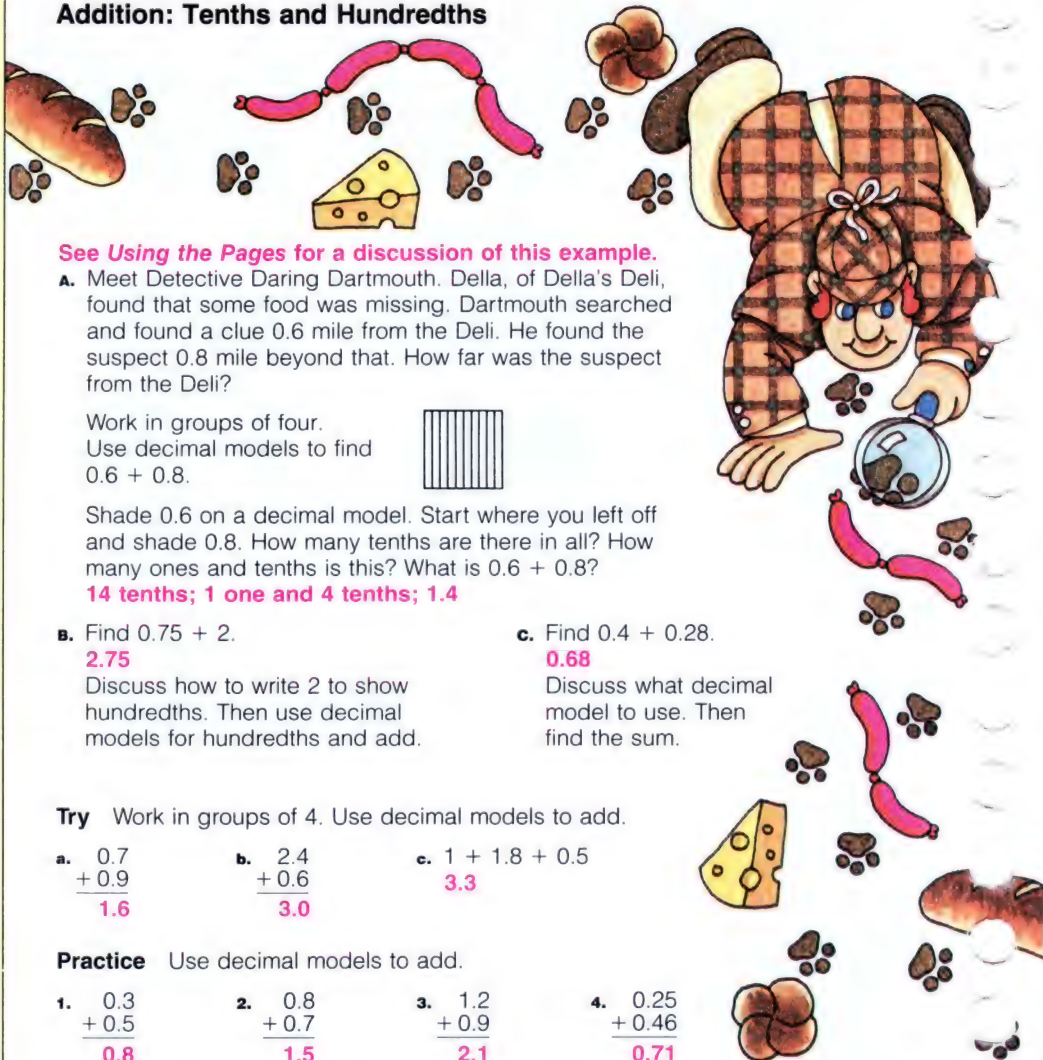
## Using the Pages

**Teach** **Using Concrete Materials** For Example A, ask students why they use decimal models for tenths. [Because they are adding tenths.] Have students shade the decimal models as indicated and then discuss the models. Students should realize that they shaded 1 one and 4 tenths. Encourage students to discuss what they can learn from their models. [10 tenths can be renamed as 1 one.] For Example B, have students read the addition exercise aloud. Be sure that students work with hundredths models. Before they begin to solve the exercise, ask them how many hundredths make up 1 tenth [10], and how many hundredths make up 1 one. [100] Students should realize that they must shade 200 hundredths to show 2 and that they can write this as 2.00. Encourage students to discuss how they found the sum. [First shade 27 hundredths, and then shade 200 hundredths which will model 2.75] For Example C, ask students why it is important to use decimal models for hundredths. [Because they have to model 28 hundredths and 4 tenths can be renamed as 40 hundredths.]

**Practice** For Exercise 11, first have students use their decimal models to find the sum. Ask them what decimal models they should use. [Hundredths] Then discuss each step of the algorithm. Point out that 3 is written 3.00. Students should realize that the decimal points are lined up so that they will be sure to add tenths to tenths, hundredths to hundredths, and so on. Encourage students to discuss the similarities between adding decimals and adding whole numbers. [When adding whole numbers, you must line up the numbers so that you will add ones to ones, tens to tens, hundreds to hundreds, and so on.]

For Exercises 17–25, remind stu-  
(Continued on page 289.)

## Addition: Tenths and Hundredths



### See Using the Pages for a discussion of this example.

- A.** Meet Detective Daring Dartmouth. Della, of Della's Deli, found that some food was missing. Dartmouth searched and found a clue 0.6 mile from the Deli. He found the suspect 0.8 mile beyond that. How far was the suspect from the Deli?

Work in groups of four.  
Use decimal models to find  
 $0.6 + 0.8$ .



Shade 0.6 on a decimal model. Start where you left off and shade 0.8. How many tenths are there in all? How many ones and tenths is this? What is  $0.6 + 0.8$ ?

**14 tenths; 1 one and 4 tenths; 1.4**

- B.** Find  $0.75 + 2$ .

**2.75**

Discuss how to write 2 to show hundredths. Then use decimal models for hundredths and add.

- C.** Find  $0.4 + 0.28$ .

**0.68**

Discuss what decimal model to use. Then find the sum.

**Try** Work in groups of 4. Use decimal models to add.

$$\begin{array}{r} 0.7 \\ + 0.9 \\ \hline 1.6 \end{array}$$

$$\begin{array}{r} 2.4 \\ + 0.6 \\ \hline 3.0 \end{array}$$

$$\begin{array}{r} 1 + 1.8 + 0.5 \\ \hline 3.3 \end{array}$$

**Practice** Use decimal models to add.

$$\begin{array}{r} 0.3 \\ + 0.5 \\ \hline 0.8 \end{array}$$

$$\begin{array}{r} 0.8 \\ + 0.7 \\ \hline 1.5 \end{array}$$

$$\begin{array}{r} 1.2 \\ + 0.9 \\ \hline 2.1 \end{array}$$

$$\begin{array}{r} 0.25 \\ + 0.46 \\ \hline 0.71 \end{array}$$

$$5. 0.83 + 0.17$$

**1**

$$6. 2 + 0.6$$

**2.06**

$$7. 0.3 + 0.9 + 0.7$$

**1.9**

$$8. 0.64 + 2.13$$

**2.77**

$$9. 1.7 + 0.64$$

**2.34**

$$10. 0.4 + 0.37 + 1$$

**1.77**

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## Practice 107

Name \_\_\_\_\_

**P107**

Add.

|  |   |   |  |
|--|---|---|--|
| 1. $\begin{array}{r} 5.3 \\ + 2.6 \\ \hline 7.9 \end{array}$     | 2. $\begin{array}{r} 6.7 \\ + 1.5 \\ \hline 8.2 \end{array}$      | 3. $\begin{array}{r} 4.8 \\ + 2.7 \\ \hline 7.5 \end{array}$      | 4. $\begin{array}{r} 2.34 \\ + 6.9 \\ \hline 30.3 \end{array}$     |
| 5. $\begin{array}{r} 3.07 \\ + 9.17 \\ \hline 12.24 \end{array}$ | 6. $\begin{array}{r} 47.36 \\ + 2.65 \\ \hline 50.01 \end{array}$ | 7. $\begin{array}{r} 53.74 \\ + 0.43 \\ \hline 54.17 \end{array}$ | 8. $\begin{array}{r} 45.68 \\ + 38.26 \\ \hline 83.94 \end{array}$ |

9.  $2.43 + 7.48 =$  **9.91**

10.  $64.5 + 28.3 =$  **92.8**

11.  $63.1 + 10 + 12.8 =$  **85.9**

12.  $0.32 + 0.20 + 8 =$  **8.52**

13.  $0.63 + 0.21 + 4 =$  **4.84**

14.  $21 + 3.8 + 0.5 =$  **25.3**

Add across. Add down.

|       |      |       |
|-------|------|-------|
| 0.88  | 1.96 | 2.84  |
| 16.51 | 0.65 | 17.16 |
| 17.39 | 2.61 | 20.00 |

|       |       |       |
|-------|-------|-------|
| 45.32 | 0.77  | 46.09 |
| 6.85  | 12.42 | 19.27 |
| 52.17 | 13.19 | 65.36 |

## Reteaching 107

Name \_\_\_\_\_

**R107**

Find  $4.6 + 2$ .

Line up the decimal points.

$$\begin{array}{r} 4.6 \\ + 2.0 \\ \hline 6.6 \end{array}$$

Use me to help you add.

What are the two longest rivers?

Add. Match each letter to its answer in the blanks below.

|   |   |   |  |
|---|---|---|--|
| 1. $\begin{array}{r} 3.6 \\ + 2.7 \\ \hline 6.3 \end{array}$ N    | 2. $\begin{array}{r} 4.8 \\ + 3.9 \\ \hline 8.7 \end{array}$ M  | 3. $\begin{array}{r} 4.67 \\ + 1.14 \\ \hline 5.81 \end{array}$ N | 4. $\begin{array}{r} 5.4 \\ + 1.4 \\ \hline 6.8 \end{array}$ E     |
| 5. $\begin{array}{r} 6.00 \\ + 1.98 \\ \hline 7.98 \end{array}$ A | 6. $\begin{array}{r} 7.9 \\ + 8.2 \\ \hline 16.1 \end{array}$ Z | 7. $\begin{array}{r} 6.93 \\ + 2.46 \\ \hline 9.39 \end{array}$ A | 8. $\begin{array}{r} 8.67 \\ + 1.96 \\ \hline 10.23 \end{array}$ D |

9.  $12.46 + 9.84 =$  **22.30** L

10.  $7.9 + 7.2 =$  **15.1** A

11.  $8.3 + 6.9 =$  **15.2** D

12.  $2.47 + 1.48 =$  **3.95** N

|      |      |       |      |       |     |
|------|------|-------|------|-------|-----|
| A    | M    | A     | Z    | O     | N   |
| 15.1 | 8.7  | 9.39  | 16.1 | 15.2  | 6.3 |
| A    | N    | D     | N    | L     | E   |
| 7.98 | 5.81 | 10.23 | 3.95 | 22.30 | 6.8 |



## Assignment Guide

|          |                         |
|----------|-------------------------|
| basic    | 1–25 odd, 26–27         |
| average  | 1–10 odd or even, 11–27 |
| enriched | 1–27                    |

**More Practice Set 107,  
page 390**

11. Find  $3 + 1.25 + 0.7$ .

Estimate using  
front-end digits:  
 $3 + 1 + 0 = 4$

Here is how you can record your work.

$$\begin{array}{r} 3.00 \\ 1.25 \\ + 0.7 \\ \hline \end{array}$$

Write 3 as 3.00.  
Line up the decimal  
points. Write the  
decimal point in the  
answer.

$$\begin{array}{r} \text{Add the} \\ \text{hundredths.} \\ 3.00 \\ 1.25 \\ + 0.7 \\ \hline 2 \end{array}$$

$$\begin{array}{r} \text{Add the} \\ \text{tenths.} \\ 3.00 \\ 1.25 \\ + 0.7 \\ \hline 72 \end{array}$$

$$\begin{array}{r} \text{Add the} \\ \text{ones.} \\ 3.00 \\ 1.25 \\ + 0.7 \\ \hline 4.72 \end{array}$$

Discuss how you write a whole number when you add it to a decimal. Why do you think you line up the decimal points? How is adding decimals like adding whole numbers?

**See margin.**

Add.

$$\begin{array}{r} 12. 9.06 \\ + 0.35 \\ \hline 9.41 \end{array}$$

$$\begin{array}{r} 13. 12.48 \\ + 8.04 \\ \hline 20.52 \end{array}$$

$$\begin{array}{r} 14. 51.24 \\ + 8.39 \\ \hline 59.63 \end{array}$$

$$\begin{array}{r} 15. 0.07 \\ + 16.07 \\ \hline 16.14 \end{array}$$

$$\begin{array}{r} 16. 45.67 \\ + 60.88 \\ \hline 106.55 \end{array}$$

$$\begin{array}{r} 17. 45.6 + 23.4 \\ \hline 69.0 \end{array}$$

$$\begin{array}{r} 18. 7.19 + 6.34 \\ \hline 13.53 \end{array}$$

$$\begin{array}{r} 19. 47 + 61.42 \\ \hline 108.42 \end{array}$$

$$\begin{array}{r} 20. 25 + 4.8 + 3.5 \\ \hline 33.3 \end{array}$$

$$\begin{array}{r} 21. 5 + 7.3 + 0.8 \\ \hline 13.1 \end{array}$$

$$\begin{array}{r} 22. 2 + 0.37 + 0.45 \\ \hline 2.82 \end{array}$$

$$\begin{array}{r} 23. 6 + 0.40 + 1.92 \\ \hline 8.32 \end{array}$$

$$\begin{array}{r} 24. 0.25 + 0.56 + 7 \\ \hline 7.81 \end{array}$$

$$\begin{array}{r} 25. 1.30 + 5 + 0.78 \\ \hline 7.08 \end{array}$$

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation  
Choose a method to solve each problem. Tell which method you used.

26. Daring Dartmouth discovered that rolls costing \$5.23 and rye bread costing \$0.97 were missing. About how much did the rolls and rye bread cost together?  
**\$6.00; E**

27. Della told Dartmouth that 39.4 pounds of food were taken on Monday, 25.8 pounds on Tuesday, 44.6 pounds on Wednesday, and 38.7 pounds on Thursday. How many pounds were taken in all? **148.5 pounds; C**



More Practice Set 107, page 390 289

(Continued from page 288.)

For Exercises 17–25, remind students to write each exercise in vertical form, making sure they line up the decimal points and then write a decimal point in the answer.

**Estimation** Have students determine whether or not their answers are reasonable by adding only the whole number parts of the decimal.

**Error Analysis** In Exercises 17–25, watch for students who do not align the decimals correctly when writing the exercises in vertical form. Have these students write the exercises in place-value charts.

**Apply** *Problem Solving*

**Choosing a computation method** Have students explain why they chose the method that they used.

Remind students to write the dollar sign notation in their answer to Problem 26.

## Follow-Up

**Enrichment** *Write a problem* Let students make up original story problems involving addition of tenths and hundredths, exchange with classmates, and solve the problems. Some topics students could write about are athletic records, gallons or liters of gasoline, and linear measurements.

## Computer Assisted Instruction

Mathematics Courseware Series

- Decimals 1, Activity 4

## Daily Maintenance

- $34 \times 163$  [5,542]
- $18 \times 852$  [15,336]
- $62 \times 591$  [36,642]
- $27 \times 384$  [10,368]
- $16 \times 419$  [6,704]

**Answers, page 289**

11. When adding a whole number and a decimal, write the whole number, followed by a decimal point and as many zeros as there are places to the right of the decimal point in the decimal that you are adding.

## Enrichment 107

Name \_\_\_\_\_ E107

**Decimal Palindromes**

A **palindrome** is a number like 35.53. The number does not change when you reverse the digits. You can use addition to find a decimal palindrome.

$$\begin{array}{r} 17.8 \\ + 87.1 \\ \hline 26.51 \\ + 15.62 \\ \hline 42.13 \\ + 31.24 \\ \hline 73.37 \end{array}$$

Try 17.8 as a starting decimal.  
Reverse the digits. Add.  
Reverse the digits. Add.  
Repeat the steps.  
73.37 is a palindrome.

Find palindromes by starting with these decimals.

|              |              |              |              |
|--------------|--------------|--------------|--------------|
| 1. 8.3       | 2. 61.8      | 3. 71.2      | 4. 34.1      |
| <u>13.31</u> | <u>69.96</u> | <u>73.37</u> | <u>35.53</u> |

|              |              |              |                |
|--------------|--------------|--------------|----------------|
| 5. 6.9       | 6. 28.1      | 7. 9.7       | 8. 129.1       |
| <u>33.33</u> | <u>29.92</u> | <u>37.73</u> | <u>251.152</u> |

9. What was the greatest number of steps that you needed before getting a palindrome? 3

10. Try to find a starting decimal that will require even more steps. Answers will vary. 8.93 has five steps.

## Additional Resource 107

Name \_\_\_\_\_ Additional Resource 107

**Calculator** **Decimal Paths**

Use me to add the lengths of the sections.

List paths from I to K. Use your calculator to find the length of each path. *Other paths are possible.*

| Path      | Lengths of sections         | Length of path |
|-----------|-----------------------------|----------------|
| 1. ILMK   | 1.6 + 1.0 + 1.5             | 4.1            |
| 2. IHMK   | 2.8 + 1.1 + 1.5             | 5.4            |
| 3. IHK    | 2.8 + 1.4                   | 4.2            |
| 4. ILJK   | 1.8 + 1.7 + 3.3             | 6.8            |
| 5. ILMHK  | 1.8 + 1.0 + 1.1 + 1.4       | 5.3            |
| 6. IJK    | 1.6 + 3.3                   | 4.9            |
| 7. IJLMK  | 1.6 + 1.7 + 1.0 + 1.5       | 5.8            |
| 8. IJLMHK | 1.6 + 1.7 + 1.0 + 1.1 + 1.4 | 6.8            |



## Objective 108

Subtract decimals through hundredths.

### Lesson Theme

Reading: Fantasy

### Materials

- Decimal Models (Teaching Aid H)

## Introduction

**Warm-Up Review** Review subtraction of whole numbers using the following exercises involving renaming:

$$25 - 18 [7] \quad 348 - 294 [54]$$

$$5,238 - 1,475 [3,763]$$

## Using the Pages

**Teach** **Using Concrete Materials** After students have worked through Example A, ask students what type of models they used and why. [Decimal models for tenths because both decimals are written in tenths.] Have students display their models with 3.2 shaded. Then ask them to explain how they can show subtraction with their models. [By crossing out 1 one and 7 tenths.] Ask them what they notice when they subtract. [There are not enough tenths to subtract 7 tenths.] Then ask students what they must do to make more tenths. [Rename 1 one as 10 tenths.] There are now enough tenths to subtract. They should then cross out 7 tenths and 1 one on their models. Ask them to write the decimal that their models now show. Write the following on the chalkboard to help students summarize what they did.

$$\begin{array}{r} 3 \text{ ones } 2 \text{ tenths} \\ - 1 \text{ one } 7 \text{ tenths} \\ \hline 2 \text{ ones } 12 \text{ tenths} \\ - 1 \text{ one } 7 \text{ tenths} \\ \hline 1 \text{ one } 5 \text{ tenths} \end{array}$$

Then discuss the written exercise shown in Example A. Have students relate each step with their work with the models. For Examples B and C, students should realize that they must write 6 as 6.00 and 7 as 7.00 before they begin subtracting. Be sure they line up the decimals. Encourage students to discuss each step as they subtract in each example.

**Try Error Analysis** Watch for students who forget to add zeros in Exercises b and c before subtracting. Have students write these exercises in place-value charts.

**Practice** **Choosing a computation method** Ask students to explain why they chose the method that they used.

Students should add zeros in Exercises 12, 13, and 15–19 before computing.

(Continued on page 291.)

## Subtraction: Tenths and Hundredths

- A.** Daring Dartmouth was 3.2 kilometers from the treasure he was hired to find when he learned that Pirate Mean Moe was only 1.7 kilometers from the treasure. How much closer was Moe?

Find  $3.2 - 1.7$ .

Work in groups of 4. Use decimal models to show 3.2. Discuss how you can remove 1.7. What must you do before you can remove 7 tenths? Remove 7 tenths. Then remove 1 one. What is  $3.2 - 1.7$ ?

Here is how you can record your work.

Line up the decimal points. Write the decimal point in the answer.

$$\begin{array}{r} 3.2 \\ - 1.7 \\ \hline \end{array}$$

Rename to show 10 more tenths.

$$\begin{array}{r} 2 \text{ } 12 \\ \cancel{3} \cancel{2} \\ - 1.7 \\ \hline \end{array}$$

Subtract the tenths.

$$\begin{array}{r} 2 \text{ } 12 \\ \cancel{3} \cancel{2} \\ - 1.7 \\ \hline .5 \end{array}$$

Subtract the ones.

$$\begin{array}{r} 2 \text{ } 12 \\ \cancel{3} \cancel{2} \\ - 1.7 \\ \hline 1.5 \end{array}$$

Moe was 1.5 kilometers closer to the treasure.

- B.** Find  $18.37 - 6$ .

**12.37**

Discuss how you are going to write 6. Then subtract.

- C.** Find  $7 - 2.38$ .

**4.62**

Discuss how to write 7. Then subtract.

**Try** Subtract. Use decimal models to subtract in Exercises a and b.

- a.**  $2.5 - 1.2$

**1.3**

- b.**  $3 - 1.65$

**1.35**

- c.**  $6.74 - 3$

**3.74**

- d.**  $8.06 - 3.45$

**4.61**

**Practice** **Choosing a Computation Method** Calculator, Paper and Pencil, Mental Math Choose a method to find each answer. Tell which method you used.

**1.**  $\begin{array}{r} 9.7 \\ - 6.3 \\ \hline \end{array}$

**3.4; M**

**2.**  $\begin{array}{r} 8.2 \\ - 2.8 \\ \hline \end{array}$

**5.4; P**

**3.**  $\begin{array}{r} 15.8 \\ - 2.6 \\ \hline \end{array}$

**13.2; M**

**4.**  $\begin{array}{r} 2.43 \\ - 0.29 \\ \hline \end{array}$

**2.14; P**

**5.**  $\begin{array}{r} 2.68 \\ - 1.87 \\ \hline \end{array}$

**0.81; P**

**6.**  $\begin{array}{r} 19.21 \\ - 4.87 \\ \hline \end{array}$

**14.34; P, C**

**7.**  $\begin{array}{r} 37.58 \\ - 17.40 \\ \hline \end{array}$

**20.18; M**

**8.**  $\begin{array}{r} 9.06 \\ - 3.57 \\ \hline \end{array}$

**5.49; P, C**

**9.**  $\begin{array}{r} 14.15 \\ - 10.07 \\ \hline \end{array}$

**4.08; P, C**

**10.**  $\begin{array}{r} 80.91 \\ - 77.87 \\ \hline \end{array}$

**3.04; P, C**

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## Practice 108

Name \_\_\_\_\_ P108

Subtract.

|  |  |  |  |
|--|--|--|--|
| 1. $\begin{array}{r} 3.64 \\ - 2.12 \\ \hline \end{array}$ | 2. $\begin{array}{r} 5.91 \\ - 3.76 \\ \hline \end{array}$ | 3. $\begin{array}{r} 4.63 \\ - 4.8 \\ \hline \end{array}$    | 4. $\begin{array}{r} 8.2 \\ - 4.6 \\ \hline \end{array}$     |
| <b>15.2</b>  | <b>2.15</b>  | <b>41.5</b>  | <b>3.6</b>   |
| 5. $\begin{array}{r} 86.5 \\ - 27.3 \\ \hline \end{array}$ | 6. $\begin{array}{r} 1.61 \\ - 0.85 \\ \hline \end{array}$ | 7. $\begin{array}{r} 4.567 \\ - 1.234 \\ \hline \end{array}$ | 8. $\begin{array}{r} 2.436 \\ - 1.628 \\ \hline \end{array}$ |
| <b>59.2</b>  | <b>0.76</b>  | <b>33.33</b>   | <b>8.08</b>  |
| 9. $62.41 - 36.14 =$                                       | 10. $5.04 - 1.50 =$  | <b>26.27</b> <b>3.54</b>                                     |  |
| 11. $25.4 - 16 =$  | 12. $8 - 3.15 =$   | <b>9.4</b> <b>4.85</b>                                       |  |
| 13. $47 - 25.34 =$   | 14. $54.28 - 6.19 =$                                       | <b>21.66</b> <b>48.09</b>                                    |  |

Solve the problem.

15. Several children made a paper dragon 13 meters long. One of the children went home and took 3.8 meters of the dragon's tail with her. How long was the dragon then?

**9.2 meters**

## Reteaching 108

Name \_\_\_\_\_ R108

Find  $6.85 - 2$ .

Line up the decimal points.

Subtract the hundredths.

Subtract the tenths.

Subtract the ones.

Use us to help you subtract.

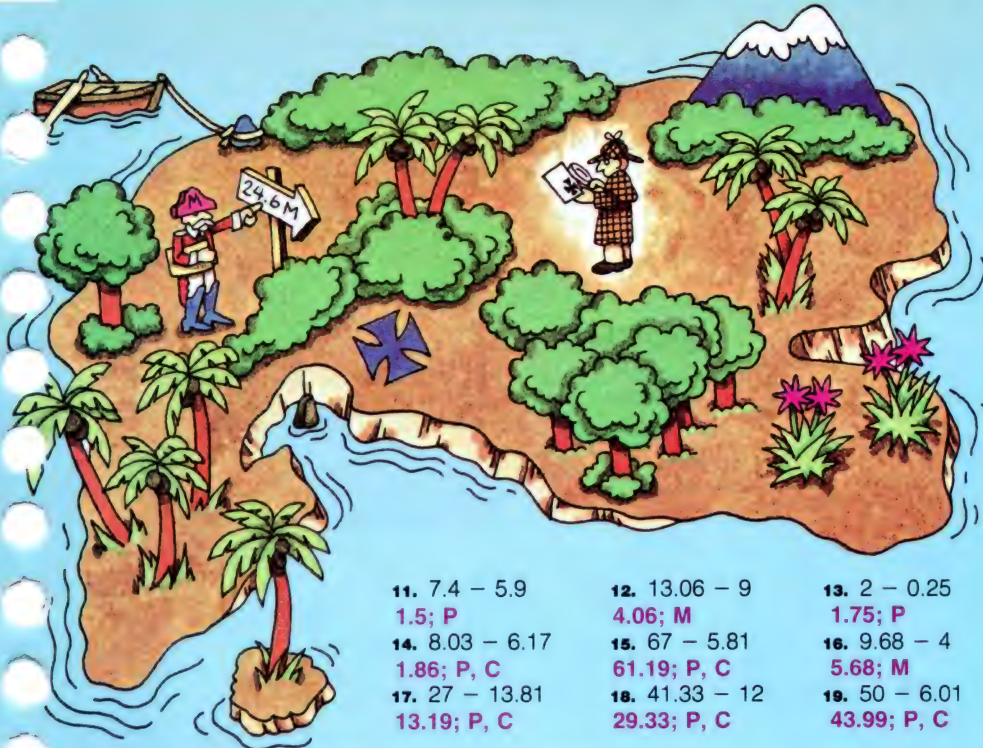
What ocean covers about half the earth?

Subtract. Match each letter to its answer in the blanks below.

|  |  |  |  |
|--|--|--|--|
| 1. $\begin{array}{r} 4.6 \\ - 1.7 \\ \hline \end{array}$ | 2. $\begin{array}{r} 4.5 \\ - 2.8 \\ \hline \end{array}$   | 3. $\begin{array}{r} 7.32 \\ - 1.76 \\ \hline \end{array}$ | 4. $\begin{array}{r} 7.8 \\ - 3.5 \\ \hline \end{array}$ |
| <b>2.9</b> E   | <b>1.7</b> C   | <b>5.56</b> N  | <b>4.3</b> I   |
| 5. $\begin{array}{r} 9.1 \\ - 5.4 \\ \hline \end{array}$ | 6. $\begin{array}{r} 8.53 \\ - 4.28 \\ \hline \end{array}$ | 7. $\begin{array}{r} 8.6 \\ - 2.9 \\ \hline \end{array}$   | 8. $\begin{array}{r} 9.1 \\ - 3.6 \\ \hline \end{array}$ |
| <b>3.7</b> C   | <b>4.25</b> I  | <b>5.7</b> C   | <b>5.5</b> A   |
| 9. $3.30 - 1.05 =$                                       | 10. $6.19 - 4.58 =$  | <b>2.25</b> P <b>1.61</b> O                                |  |
| 11. $30.3 - 11.7 =$                                      | 12. $9.14 - 6.78 =$  | <b>18.6</b> F <b>2.36</b> A                                |  |

|      |      |      |     |      |      |      |
|------|------|------|-----|------|------|------|
| P    | A    | C    | I   | F    | I    | C    |
| 2.25 | 2.36 | 3.7  | 4.3 | 18.6 | 4.25 | 5.7  |
|      |      | O    | C   | F    | A    | N    |
|      |      | 1.61 | 1.7 | 2.9  | 5.5  | 5.56 |





- |  |  |                                       |
|--|--|---------------------------------------|
| 11. $7.4 - 5.9$<br><b>1.5; P</b>       | 12. $13.06 - 9$<br><b>4.06; M</b>      | 13. $2 - 0.25$<br><b>1.75; P</b>      |
| 14. $8.03 - 6.17$<br><b>1.86; P, C</b> | 15. $67 - 5.81$<br><b>61.19; P, C</b>  | 16. $9.68 - 4$<br><b>5.68; M</b>      |
| 17. $27 - 13.81$<br><b>13.19; P, C</b> | 18. $41.33 - 12$<br><b>29.33; P, C</b> | 19. $50 - 6.01$<br><b>43.99; P, C</b> |

**Apply** *Choosing a Computation Method* Calculator, Paper and Pencil, Mental Math, Estimation Choose a method to solve each problem. Tell which method you used.

20. Moe was now closer to the treasure than Dartmouth. So he changed the road sign to show 24.6 meters instead of 9.8 meters. By how many meters was the road sign changed?  
**14.8 M; P**
22. Dartmouth's map showed that the buried treasure was 9.2 meters from Parrot Cove. Moe's map showed the treasure was 5.7 meters from Parrot Cove. How much less was the distance shown on Moe's map?  
**3.5 M; P**
24. Dartmouth's compass cost \$2.60. His magnifying glass cost \$8.40. What was the cost of both items?  
**\$11; M**
21. To dig for treasure, Dartmouth bought a pick, a hoe, and a shovel. Each of the 3 items cost the same. The total cost was \$9.78. What was the cost of each item?  
**\$3.26; P, C**
23. Dartmouth dug and found two treasure chests weighing 19.43 kilograms together. One chest weighed 5.08 kilograms. About how many kilograms did the second chest weigh?  
**14 kg; E**
25. *Write a problem.* Write a problem that will help Dartmouth find the treasure. Then solve the problem.  
**Answers will vary.**

More Practice Set 108, page 390 291

## Assignment Guide

|          |                         |
|----------|-------------------------|
| basic    | 1-10, 11-18 even, 20-24 |
| average  | 1-16, 20-24             |
| enriched | 1-19 odd or even, 20-25 |

**More Practice Set 108,**  
page 390

### Homework to do with others

Encourage students to ask an adult for help with this problem: Before Daring Dartmouth began his search for buried treasure, he bought food for the trip. At one store he spent \$58.88 and at the second store he spent \$7.36. If he now has \$3.68, how much money did he have at the start? Ask students to report their solutions and the strategies that they used.

(Continued from page 290.)

**Estimation** Have students determine whether or not their answers are reasonable by subtracting only the ones.

### Apply Problem Solving

**Choosing a computation method** Ask students to explain their reasons for choosing the method that they used.

In Problem 23, explain that students could subtract only the whole numbers (19 - 5) to see that 14 kg is the best estimate.

## Follow-Up

**Reteaching** Have students do the practice exercises on lined paper turned sideways, so that each number is in a space and the decimal points are on a line. Example:

|   |   |   |   |
|---|---|---|---|
| 1 | 3 | 0 | 6 |
| - | 9 | 0 | 0 |

Have students write place-value column headings above the digits.

### Computer Assisted Instruction

Mathematics Courseware Series

- Decimals 1, Activity 5

### Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

- $421 + 976 + 205$  [1,602]
- $363 \div 3$  [121]
- $876 - 342$  [534]
- $25 \times 30$  [750]
- $893 \div 46$  [19 R19]
- $698 \times 5$  [3,490]

## Enrichment 108

Name \_\_\_\_\_ E108

**Decimal Magic Squares**

Are these magic squares? Write yes or no. If your answer is yes, give the magic sum.

1. 

|     |     |     |
|-----|-----|-----|
| 9.5 | 8.1 | 9.1 |
| 8.5 | 8.9 | 9.3 |
| 8.7 | 9.7 | 8.3 |

**26.7**

2. 

|      |      |      |
|------|------|------|
| 9.6  | 11   | 8.2  |
| 12.4 | 7.5  | 8.9  |
| 6.8  | 10.3 | 11.7 |

**No**

Remember, each column, row, and diagonal must have the same sum.

Fill in the missing numbers to make each of the following a magic square. Write the magic sum.

3. 

|      |      |      |
|------|------|------|
| 9.7  | 10.4 | 6.9  |
| 6.2  | 9    | 11.8 |
| 11.1 | 7.6  | 8.3  |

 Magic Sum **27**

4. 

|      |      |      |
|------|------|------|
| 29.4 | 38.5 | 32   |
| 35.9 | 13.3 | 30.7 |
| 34.6 | 28.1 | 37.2 |

 Magic Sum **99.9**

5. 

|       |       |       |
|-------|-------|-------|
| 35.71 | 26.08 | 74.23 |
| 83.86 | 45.34 | 6.82  |
| 16.45 | 64.60 | 54.97 |

 Magic Sum **136.02**

6. 

|      |      |      |
|------|------|------|
| 28.9 | 40.1 | 68.1 |
| 84.9 | 45.7 | 6.5  |
| 23.3 | 51.3 | 62.5 |

 Magic Sum **137.1**

## Additional Resource 108

Name \_\_\_\_\_ Additional Resource 108

Calculator Decimal Mazes

Use me to subtract a series of decimals. I will help you find a path through the mazes.

Find the correct path through the mazes. To do this, subtract the number in each box you pass through. The final number must equal the exit number.

1. 

|     |     |     |
|-----|-----|-----|
| 1.6 | 2.1 | 7.2 |
| 3.3 | 2.7 | 1.6 |
| 4.9 | 1.8 | 2.8 |

 Enter 27.6 Exit 11.9

2. 

|     |     |     |
|-----|-----|-----|
| 1.3 | 0.9 | 2.0 |
| 0.6 | 3.3 | 1.2 |
| 2.6 | 1.8 | 0.3 |

 Enter 8.1 Exit 1.9

3. 

|      |      |      |
|------|------|------|
| 3.81 | 3.85 | 2.33 |
| 6.17 | 5.41 | 9.99 |
| 1.87 | 3.65 | 2.37 |

 Enter 56.34 Exit 29.25



## Objective 109

Solve problems by choosing addition or subtraction of decimals.

### Lesson Theme

Recreation: Model Airplanes

## Introduction

**Warm-Up Review** Review situations where addition and subtraction are involved. Ask questions such as: "How would you find the total cost of two items?" [Addition] "How would you find how much more one item costs than another?" [Subtraction] "How would you find how much longer one distance is than another?" [Subtraction]

## Using the Pages

**Teach** Review the step-by-step problem-solving method used throughout the text. Read and discuss the example. In the *Plan* step emphasize that subtraction is the correct operation to use because we are comparing two distances. In the *Look Back* step, show that students can add to see if the answer is reasonable. Stress that students need to look back after solving each problem to see if the answer is sensible.

**Try** Have students read each problem silently. Then have a student describe the action in each problem in his or her own words.

**Apply Problem Solving** Be sure students decide what operation to use before they begin computing.

**Error Analysis** Watch for students who forget to check to see if their answers make sense. You may want to have students discuss each answer telling how they decided what to do and how they determined that their answer is reasonable. (See Reteaching 109.)

**Choosing a computation method** Read these problems to the students and have them choose whether to estimate or to compute an exact answer.

1. Paul's plane has a wingspan of 1.2 meters. Barbara's plane has a wingspan of 2.1 meters. How much longer is the wingspan on Barbara's plane? [0.9 meters]

2. T.J. needs to buy a new propeller for each of his 2 planes. Each propeller costs \$3.25. Will \$7.00 be enough to pay for them? [Yes]

### Problem Solving

### Choose the Operation

Marla and Brian attended the 4th Annual Model Airplane Competition. In the longest flight competition, Marla's plane flew a distance of 52.4 meters. Brian's plane flew 38.2 meters. How much farther did Marla's plane fly?

**Read** Facts: Marla's plane—52.4 meters  
Brian's plane—38.2 meters  
Find: How many more meters did Marla's plane fly?

**Plan** Use subtraction to compare the two distances.  
Find  $52.4 - 38.2$ .

**Solve**

$$\begin{array}{r} 52.4 \\ - 38.2 \\ \hline 14.2 \end{array}$$

Estimate:  
 $50 - 40 = 10$

**Answer** Marla's plane flew 14.2 meters farther.

**Look Back** Add your answer to the distance Brian's plane flew, to get the distance Marla's plane flew.  
 $38.2 + 14.2 = 52.4$

**Try** Tell whether you add or subtract. Then find the answer.

- a. Simon's plane flew 43.6 meters on the first flight and 25.7 meters on the second flight. How far did his plane fly on both flights?  
**Add. 69.3 m**
- b. Deborah had two planes. One plane had a wingspan of 2.3 meters. The other plane had a wingspan of 1.9 meters. How much longer is the wingspan on the larger plane?  
**Subtract. 0.4 m**

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## Practice 109

Name: \_\_\_\_\_

P109

The javelin throw is an event in the Olympic Games. Past winners and the lengths of their throws are given in the table.

| Year | Winner            | Country       | Distance     |
|------|-------------------|---------------|--------------|
| 1948 | Tapio Rautavaara  | Finland       | 55.76 meters |
| 1952 | Cyrus Young       | United States | 73.78 meters |
| 1956 | Egil Danielson    | Norway        | 65.71 meters |
| 1960 | Victor Talbulenko | USSR          | 84.64 meters |
| 1964 | Pauli Naavala     | Finland       | 82.46 meters |
| 1968 | Janis Lutsis      | USSR          | 90.09 meters |
| 1972 | Klaus Wolfermann  | West Germany  | 90.47 meters |
| 1976 | Miklos Nemeth     | Hungary       | 94.59 meters |

For each exercise, tell whether you would add or subtract. Then give the answer.

1. How much farther did Miklos Nemeth throw the javelin than Tapio Rautavaara?  
**Subtract**  
24.83 meters

2. How much less than 100 meters was the throw of the 1976 winner?  
**Subtract**  
5.41 meters

3. How many meters farther did the 1968 winner throw the javelin than the 1952 winner?  
**Subtract**  
16.31 meters

4. How many fewer meters did Pauli Naavala throw the javelin than Egil Danielson?  
**Subtract**  
3.05 meters

5. 75.81 meters was the winning hammer throw distance in 1972. In 1976, the winning throw was 1.71 meters longer. How many meters did the 1976 winner throw the hammer?  
**Add**  
77.52 meters

6. 67.5 meters was the men's winning discus throw in 1976. In the women's competition, Evelin Schlaak threw the discus 1.5 meters farther. How long was her throw?  
**Add**  
69 meters

## Reteaching 109

Name: \_\_\_\_\_

R109

Rosa's class made kites for their spring art project.

The tail on Rosa's kite was 2.7 meters long. The tail on Joe's kite was 4.1 meters long. How much longer was the tail on Joe's kite?

The tail on Joe's kite was 1.4 meters longer.

Circle the correct operation. Then solve the problem.

1. Josh had 50.2 meters of line on his kite. He tied on another ball with 75.5 meters of line. How much line did he have then?  
**Addition** **Subtraction**  
125.7 meters

2. The tail on Kristen's kite was 3.7 meters long. She cut off 1.3 meters. How long was the tail then?  
**Addition** **Subtraction**  
2.4 meters

3. Carmen spent 5.8 hours building her kite. Jamie spent 6.1 hours building his kite. How much longer did it take Jamie to finish?  
**Addition** **Subtraction**  
0.3 hours

4. Tori spent \$3.68 on supplies for her kite. She gave the clerk \$5.00. How much change did the clerk give her?  
**Addition** **Subtraction**  
\$ 1.32

5. The tail on Barry's kite was 1.9 meters long. He tied on another piece that was 2.4 meters long. How long was the new tail?  
**Addition** **Subtraction**  
4.3 meters





## Assignment Guide

|          |     |
|----------|-----|
| basic    | 1-4 |
| average  | 1-7 |
| enriched | 1-7 |

**More Practice Set 109,**  
page 390

## Follow-Up

**Extra Practice** Change the numbers in the *Apply* problems as follows, and have the students do the new problems.

- $\$4.23 + \$1.64 + \$2.40$  [ $\$8.27$ ]
- $\$19.50 - \$12.00$  [ $\$7.50$ ]
- $37.31 + 40.48$  [ $77.79$ ]
- $\$0.67 + \$2.28$  [ $\$2.95$ ]
- $57.20 - 28.52$  [ $28.68$ ]
- $52.4 - 4.7$  [ $47.7$ ]

**Enrichment Write a problem** Have students write their own word problems involving addition and subtraction of decimals. They may then exchange papers with classmates and solve the problems.

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choices.

- $9 \times 8$  [72]
- $6 \times 43$  [258]
- $60 \times 200$  [12,000]
- $457 \times 26$  [11,882]
- $301 \div 7$  [43]
- $64 \div 8$  [8]
- $652 \div 32$  [20 R12]
- $320 \div 40$  [8]

## Reading and Writing Mathematics

Read these numbers aloud and have students write them on their papers: 46.08, 84.9, 645.2 and 29.11.

## Daily Maintenance

- $76 \div 35$  [2 R6]
- $840 \div 42$  [20]
- $963 \div 30$  [32 R3]
- $596 \div 41$  [14 R22]
- $729 \div 64$  [11 R25]

**Using Problem-Solving Strategies,** page 429

**Apply** Tell whether you add or subtract. Then find the answer.

- To build her model airplane, Ellen spent \$5.26 for wood, \$2.73 for paint, and \$1.40 for glue. How much did she spend in all?  
**Add. \$9.39**
- John spent \$11.00 for materials to build his model airplane. He then sold the plane for \$16.85. How much money did he make on the sale?  
**Subtract. \$5.85**
- During the first flight, Diane's glider stayed in the air for 20.14 seconds. On the second flight, it stayed up for 18.53 seconds. What was the total time Diane's glider stayed in the air?  
**Add. 38.67 seconds**
- Adam bought two stickers for his plane. One sticker cost \$0.55. The other sticker cost \$1.29. How much did the stickers cost together?  
**Add. \$1.84**
- During two flights, Raul's glider stayed in the air for a total of 68.10 seconds. During the first flight, it stayed up for 29.63 seconds. How long did it stay up during the second flight?  
**Subtract. 38.47 seconds**
- Michelle's plane won first place for flying a distance of 63.8 meters. Kelly's plane flew a distance of 5.9 meters less than Michelle's. How many meters did Kelly's plane fly?  
**Subtract. 57.9 m**
- Thinking skills** Use + and - to make this number sentence correct.  
 $4.08 \square 5.7 \square 3.9 \square 6.12 = 12.00$   
 **$4.08 + 5.7 - 3.9 + 6.12 = 12.00$**

Using Problem-Solving Strategies, page 429  
More Practice Set 109, page 390 **293**

## Enrichment 109

Name \_\_\_\_\_ **E109**

**Decimal Patterns**

In each of the following sets of numbers, the next number can be found by adding or subtracting a decimal. Find the pattern and write the next three numbers in each set.

- 0.2 0.4 0.6 0.8 1.0 **1.2 1.4 1.6**
- 0.6 1.2 1.8 2.4 3.0 **3.6 4.2 4.8**
- 7.2 6.3 5.4 4.5 3.6 **2.7 1.8 0.9**
- 0.1 0.2 0.4 0.7 1.1 **1.6 2.2 2.9**
- 4.52 4.42 4.32 4.22 4.12 **4.02 3.92 3.82**
- 0.25 0.50 0.75 1.00 1.25 **1.50 1.75 2.00**
- 7.8 8.6 8.2 9.0 8.6 9.4 **9.0 9.8 9.4**
- 8.97 8.8 8.0 7.3 6.7 **6.2 5.8 5.5**
- 1.23 1.25 1.24 1.26 1.25 **1.27 1.26 1.28**
- 7.6 7.5 7.3 7.0 6.6 **6.1 5.5 4.8**

11. Add

12. Subtract

## Additional Resource 109

Name \_\_\_\_\_ **Additional Resource 109**

**Project Magic Shapes**

- The figure at the right is a magic square. To find the magic sum, add each row, column, and diagonal. If all the sums are equal, you have found the magic sum.  
Magic sum: **16.5**
- This figure is a magic triangle. The arrows show you how to add. Find the magic sum. Then fill in the missing numbers.  
Magic sum: **1.2**
- This figure is a magic star. Add along the straight lines to find the magic sum. Then fill in the missing numbers.  
Magic sum: **1.24**



## Using Problem-Solving Strategies

- Try and check.
- List all possibilities.

### Introduction

Students try to find all possible ways that a football team can score 16 points. They will be encouraged to write these possibilities in an organized list to help them eliminate duplications and to make the list complete.

### Using the Pages

Encourage the groups to *try and check* to find all possible ways that 16 points could be scored. Remind them that it is not necessary for each way to be likely to happen. For example, 8 safeties in a game are not likely, but they are possible. However, explain that the point after a touchdown can be used only if a touchdown is scored. That is, students cannot count 5 points as points after touchdowns unless they count 30 points for 5 touchdowns first. Remind students that they can have a touchdown without scoring a point after touchdown. Ask students if their favorite team could have a final score of 1 point. [No]

Students may begin by trying various combinations of touchdowns, field goals, and so on to find a score of 16 points. Encourage them to keep a record of their results in such a way that their list will not have duplications. Then have them answer Problems 1–4.

After each group believes that it has all possible ways, have groups compare their results, and answer Problems 5–6. Discuss what might be done to make comparing the lists easier. Have each group rewrite its list as suggested by Problem 7. The completed table will look like this:

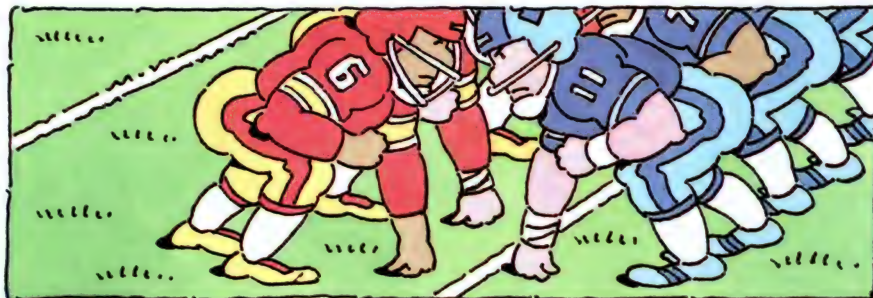
| Touchdown | Point after | Field goal | Safety |
|-----------|-------------|------------|--------|
| 2         | 2           |            | 1      |
| 2         | 1           | 1          |        |
| 2         |             |            | 2      |
| 1         | 1           | 3          |        |
| 1         | 1           | 1          | 3      |
| 1         |             | 2          | 2      |
| 1         |             |            | 5      |
|           |             | 4          | 2      |
|           |             | 2          | 5      |
|           |             |            | 8      |

There are 10 ways to score 16 points.

## Using Problem-Solving Strategies

# WHAT'S THE POINT?

During a football game last season, your favorite team scored 16 points. *What are the different ways that those 16 points could have been made?*



Points can be scored as follows:

|                           |          |
|---------------------------|----------|
| Touchdown                 | 6 points |
| Point after the touchdown | 1 point  |
| Field goal                | 3 points |
| Safety                    | 2 points |

Get into a group with 3 other students. In your group, try to find all the ways that 16 points could be scored in a football game. Make a list of all the ways that you find.

1. Could the team have scored 3 touchdowns?  
**No**
2. Could the team have scored 2 touchdowns?  
**Yes**
3. Could the team have scored 1 touchdown?  
**Yes**
4. Could the team have scored no touchdowns?  
**Yes**

Compare your list with those of other groups.



## COMPUTER

### BASIC: GO TO Statements

This program uses GO TO statements. Ordinarily, the computer follows the instructions in a program in order of the line numbers. A GO TO statement sends the computer to the line number given in the statement.

```
10 PRINT "T";
20 GO TO 50
30 PRINT "O"
40 GO TO 70
50 PRINT "W";
60 GO TO 30
70 END
```

The computer is sent to line 50, and then goes to line 60.

This is printed.

T W O

For the program above, tell which line the computer will go to after completing

1. line 10. **line 20**
2. line 20. **line 50**
3. line 30. **line 40**
4. line 40. **line 70**

Tell what would be printed for each program.

5. 10 PRINT "0.3"  
20 GO TO 40  
30 PRINT "0.7"  
40 END  
**0.3**
6. 10 PRINT "0.02";  
20 GO TO 70  
30 PRINT "0.08"  
40 GO TO 90  
50 PRINT "0.06";  
60 GO TO 30  
70 PRINT "0.04";  
80 GO TO 50  
90 END  
**0.02 0.04 0.06 0.08**

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## Assignment Guide

basic 1-8  
average 1-8  
enriched 1-8

### Computer

The GO TO statement can be typed as one word, GOTO, on most microcomputers.

Change the semicolon in Exercise 6 to commas if your computer does not leave leading spaces before all numbers separated by semicolons.

### Follow-Up

Have students organize a list to solve the following problem.

Suppose that your favorite football team scored 20 points in a game. What are the different ways that 20 points could have been made?

A table which lists each way in an organized manner is shown below.

| Touchdown | Point after | Field goal | Safety |
|-----------|-------------|------------|--------|
| 3         | 2           |            | 1      |
| 3         |             |            |        |
| 2         | 2           | 2          |        |
| 2         | 2           |            | 3      |
| 2         | 1           | 1          | 2      |
| 2         |             | 2          | 1      |
| 2         |             |            | 4      |
| 1         | 1           | 3          | 2      |
| 1         | 1           | 1          | 5      |
| 1         |             | 4          | 1      |
| 1         |             | 2          | 4      |
| 1         |             |            | 7      |
|           |             | 6          | 1      |
|           |             | 4          | 4      |
|           |             | 2          | 7      |
|           |             |            | 10     |

There are 16 ways to score 20 points.

### Computer Assisted Instruction

Mathematics Courseware Series

- Decimals 1, Activity 6

### Daily Maintenance

- $7 + 3.06$  [10.06]
- $63.81 + 9.74$  [73.55]
- $9.76 + 13$  [22.76]
- $16.41 + 36 + 17.82$  [70.23]
- $14 + 7.29 + 83.65$  [104.94]



## Objective 110

Solve problems with too much information.

### Lesson Theme

Consumer Topics: Shopping

## Introduction

**Motivational Situation** Pose the following situation to students. Suppose you were a grocer. What are some of the things that might determine how much you would charge for fruit. [How much you pay for the fruit, how much your employees are paid, how much you pay for light, heat, and so on.] Write the following shopping bill on the board:

|         |     |
|---------|-----|
| apples  | 52¢ |
| oranges | 69¢ |
| bread   | 49¢ |

Ask students to explain how the shopper would determine how much money was spent for fruit. [Add the money amounts for apples and oranges.] Then ask students what item on the list is unnecessary for finding the price of fruit. [Bread]

## Using the Pages

**Teach** Discuss each step in the example, particularly the *Plan* step, which identifies the information needed to solve the problem. Ask students what information is not needed to solve the problem, and why. [How far Danny walked. The question asks how much Danny spent.]

**Try** Problem a involves multiplication, and the hours Marco's store is open is extra information. Exercise b involves subtraction. The number of gallons of paint is extra information.

**Apply Problem Solving** Encourage students to talk about how they solve problems. This gives students more opportunities to learn from each other.

**Error Analysis** Watch for students who have difficulty deciding which information is needed to solve the problems. Have students write what is to be found in each problem. Have them then write the information from the problem which applies to this. For example, a student might write for Problem 1: pounds of fruit—5.8 pounds of apples, 4.7 pounds of grapes. (See Reteaching 110.)

The answer to Problem 5 must be used in computing the answer to Problem 6.

### Problem Solving

### Too Much Information

On Tuesday, Danny walked 1.2 miles to the grocery store and spent \$12.48 for food. Later that day, he walked 2.3 miles to the sports store and spent \$2.75 for a baseball. How much money did Danny spend on Tuesday?

#### Read

Facts: 1.2 miles to grocery store, \$12.48 for food  
2.3 miles to sports store, \$2.75 for baseball  
Find: Amount of money spent

#### Plan

To find the total amount of money spent, add the prices of the things Danny bought. The distances he walked are *extra information*. Do not use 1.2 miles and 2.3 miles.

#### Solve

$$\begin{array}{r} 12.48 \\ + 2.75 \\ \hline 15.23 \end{array}$$

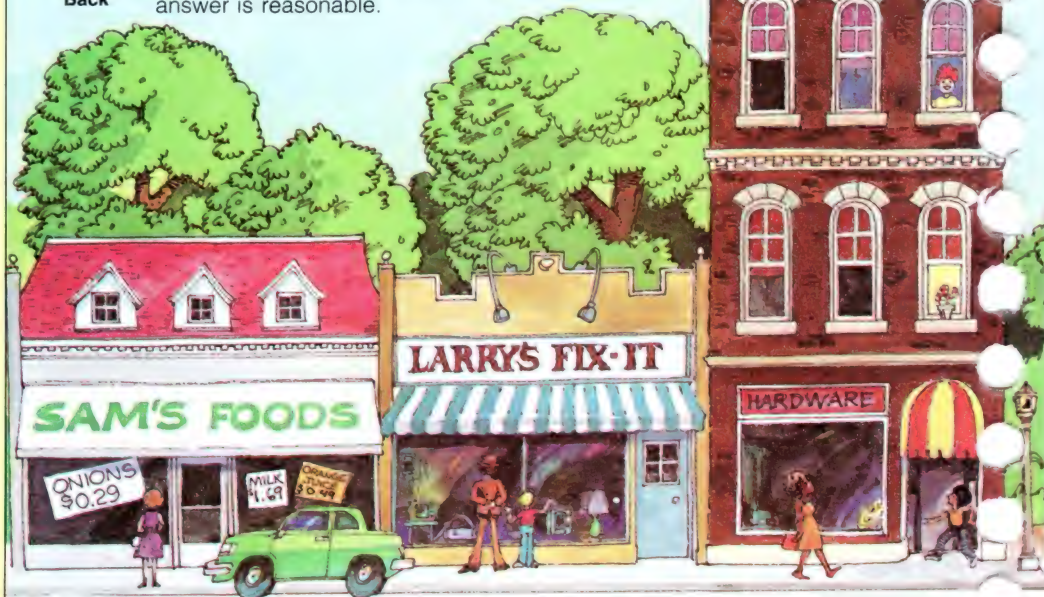
Estimate:  
\$12 + \$3 = \$15

#### Answer

Danny spent \$15.23 on Tuesday.

#### Look Back

The estimate of \$15 is close to \$15.23. The answer is reasonable.



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## Practice 110

Name: \_\_\_\_\_

P110

Solve each problem.

1. Sam bought 2 jackets for \$39.79 each and a pair of hiking boots for \$29.89. How much did he spend for the jackets?

\$79.58

2. Alex bought 4 lanterns for \$13.57 each. Pup tents were on sale for \$23.25. How much did he spend for the 4 lanterns?

\$54.28

3. Backpacks were on sale for \$25.89. Also on sale were cookware sets for \$10.49 and lanterns for \$11.29. What was the total cost of a lantern and a backpack?

\$37.18

4. Harris took \$80 with him to buy a pup tent for \$32.50 and a tent repair kit for \$3.79. How much did he spend on the pup tent and the tent repair kit?

\$36.29

5. Hiking boots went on sale for \$24.95. Marcy bought a cookware set for \$14.99 and a sleeping bag for \$26.66. How much did she spend on the cookware set and the sleeping bag?

\$41.65

6. Reflecting tape costs \$1.79 per roll. Jody bought a jacket for \$39.79 and 15 rolls of reflecting tape. How much did she spend on the reflecting tape?

\$26.85



## Reteaching 110

Name: \_\_\_\_\_

R110

Jules bought:

1.5 gallons of apple juice,  
6.6 pounds of flour, and  
2.0 gallons of orange juice.  
How many gallons of juice did Jules buy?

Jules bought 3.5 gallons of juice.

Cross off the information you do not need. Then solve the problem.

1. Jane bought 2.5 feet of red ribbon, 3.0 feet of string, and 4.5 feet of blue ribbon. How much ribbon did she buy?

2.5 feet red ribbon  
3.0 feet of string  
4.5 feet blue ribbon  
7 feet of ribbon

3. Joan worked 2.4 hours weeding the garden and 1.7 hours mowing the lawn. She rested for 15 minutes. How long did she work?

2.4 hours weeding  
1.7 hours mowing  
15 minutes resting  
4.1 hours

5. Sam worked 5.4 hours painting the bedroom and 8.7 hours painting the kitchen. He used 6 gallons of paint. How long did he work?

Flour is not juice.  
Cross it off.  
Then add.

1.5  
+ 2.0  
3.5

2. Gale spent \$2.47 on food. He gave the clerk \$5.00. He had 7 pennies in his pocket. How much change did the clerk give him?

\$2.47 for food  
\$5.00 to clerk  
\$0.07 in pocket  
\$2.53

2.1 liters  
1.8 liters  
2 apples  
3.9 liters of water

5.4 hours  
8.7 hours  
6 gallons  
14.1 hours



## Assignment Guide

|          |     |
|----------|-----|
| basic    | 1-5 |
| average  | 1-5 |
| enriched | 1-6 |

**More Practice Set 110, page 391**

**Homework to do with others** Tell students to obtain a cash register receipt from a grocery store. In a discussion with an adult, ask each student to determine the types of information (mathematical or nonmathematical) given on the receipt. Have students attach the receipt to a sheet of paper and label the types of information.

## Follow-Up

**Extra Practice** Have students do the following problems with too much information.

- In the month of May, which has 31 days, there were 3.2 inches of rain. In June, with 30 days, there were 2.5 inches of rain. How many inches of rain fell in May and June? [5.7 inches]
- Laura packed 2 sweaters, 4 shirts, 1 toothbrush, 3 skirts, and 2 books in her suitcase. How many items of clothing did she pack? [9 items]

**Reteaching** Do the *Plan* step of problem solving for Problems 1-5 with the students. Ask them to identify the extra information and to tell what operation to use to solve the problem.

**Enrichment** Write a problem Have students make up problems where there is too little information given. Have them explain what additional information would be needed to solve the problem.

## Cooperative Learning Groups

See page 483 of this Teacher's Edition.

## Daily Maintenance

- $\$5.34 \div 6$  [\$0.89]
- $\$9.56 \div 4$  [\$2.39]
- $\$9.31 \div 7$  [\$1.33]
- $\$7.04 \div 4$  [\$1.76]
- $\$7.11 \div 3$  [\$2.37]

**Try** Solve each problem.

- Marco's store is open 12.5 hours each day. Sam's store is open 8 hours per day for 7 days each week. How many hours per week is Sam's store open?  
**56 hours**
- Marco bought 18 feet of shelving and 6 gallons of paint. He used 12.5 feet of shelving. How many feet of shelving did he have left over?  
**5.5 ft.**

**Apply** Solve each problem.

- Julie bought 5.8 pounds of apples, 3.6 pounds of cheese, and 4.7 pounds of grapes. How many pounds of fruit did Julie buy?  
**10.5 pounds**
- Larry charges \$12.80 to repair a radio, \$34.50 to repair a T.V., \$10.75 to repair a clock, and \$9.35 to repair a toaster. How much did Sharon pay Larry to repair her toaster, radio, and clock?  
**\$32.90**
- Nan sells roses for \$0.98 each and a bunch of daisies for \$1.56. Beth bought 14 roses. How much did the roses cost Beth?  
**\$13.72**
- Jack bought 2 pounds of onions at Sam's Foods for \$0.29 per pound. At Marco's Food Store, onions cost \$0.35 per pound. How much did Jack spend on onions?  
**\$0.58**
- Each day, Ramon walks 3.5 miles to work at Marco's Food Store. Last week, he worked 37.5 hours. This week, he worked 39 hours. How many hours did he work in those two weeks?  
**76.5 hours**
- Beth gave Nan \$20 for the roses. How much change did she receive?  
**\$6.28**



More Practice Set 110, page 391 297

## Enrichment 110

Name \_\_\_\_\_

**To Buy or Not To Buy**

The North Side Drug Store had a clearance sale.

Decide what information is needed. Then solve the problem.

- Tom bought two 8.3-ounce tubes of toothpaste for \$0.99 each. How many ounces of toothpaste did he buy?  
**16.6 ounces**
- Maria bought 2 boxes of tissues for \$0.69 each. She paid with a \$20.00 bill. What did her purchase cost?  
**\$1.38**
- Tammy bought 17 items for a total cost of \$27.54. If she paid with \$40.00, how much change did she get?  
**\$12.46**
- If laundry detergent costs \$2.99 a box and tuna fish costs \$0.79 a can, what do 5 cans of tuna fish cost?  
**\$3.95**
- Deng had \$35.00. He looked at a first-aid kit for \$6.28 and a game for \$6.20. He bought the first-aid kit. How much money did he have left?  
**\$28.72**
- The sale price of cat food was 3 cans for \$0.89. Sara bought 9 cans of cat food and a package of dental floss for \$0.29. How much did she spend on cat food?  
**\$2.67**
- Alan bought a 3.5-ounce bottle of cologne for \$3.99 and a 4.25-ounce bottle of after shave. How many more ounces of after shave did he buy than cologne?  
**0.75 more ounces**
- Bill bought mouthwash for \$2.49. Willa bought bandages for \$1.19 and paid for them with a \$10.00 bill. How much change did Willa get?  
**\$8.81**

## Additional Resource 110

Name \_\_\_\_\_

**Computer BASIC: GOTO Statements**

The **GOTO** instruction sends the computer from one line to another in your program.

The following program repeats lines 40-50 until you stop it. Lines that are repeated in a program are called a **loop**.

```

10 REM PROGRAM LOOP
20 PRINT "DO YOU"
30 PRINT "HEAR AN"
40 PRINT "ECHO?"
50 GOTO 40
60 END
  
```

1. Run this program and show the output

DO YOU \_\_\_\_\_  
HEAR AN \_\_\_\_\_  
ECHO? \_\_\_\_\_  
ECHO? (and so on) \_\_\_\_\_

Type each of these programs. Show the output for each.

- ```

10 PRINT "A ROLLING"
20 GOTO 50
30 PRINT "NO MOSS"
40 GOTO 70
50 PRINT "STONE GATHERS"
60 GOTO 30
70 END
  
```

A ROLLING \_\_\_\_\_  
STONE GATHERS \_\_\_\_\_  
NO MOSS \_\_\_\_\_
- ```

NEW
10 REM ADD AND LOOP
20 PRINT "TYPE A DECIMAL"
30 INPUT D
40 PRINT D;" + 1.6="; D + 1.6
50 GOTO 20
60 END
  
```

TYPE A DECIMAL \_\_\_\_\_  
(D) + 1.6 = (D + 1.6) \_\_\_\_\_  
TYPE A DECIMAL (and so on) \_\_\_\_\_



## Chapter 10 Test

An acceptable score for each objective is suggested on the Chapter 10 Form of Individualizing.

If any reteaching is necessary, refer to the following pages.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| 102       | 1, 3, 4    | 278–279    |
| 103       | 2, 5, 6    | 280–281    |
| 104       | 7–9        | 282–283    |
| 105       | 10–13      | 284–285    |
| 106       | 14–17      | 286–287    |
| 107       | 18–21      | 288–289    |
| 108       | 22–26      | 290–291    |
| 109       | 27, 28     | 292–293    |
| 110       | 29, 30     | 296–297    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 30             | 100 | 22             | 73 |
| 29             | 97  | 21             | 70 |
| 28             | 93  | 20             | 67 |
| 27             | 90  | 19             | 63 |
| 26             | 87  | 18             | 60 |
| 25             | 83  | 17             | 57 |
| 24             | 80  | 16             | 53 |
| 23             | 77  | 15             | 50 |

### Additional Ideas for Evaluation

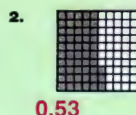
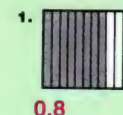
See pages 464–467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 10 Form for Individualizing
- Cumulative Record Folder

## Chapter 10 Test

Write each decimal.



3. Four tenths  
**0.4**
4. Seven and two tenths  
**7.2**
5. Nine hundredths  
**0.09**
6. One and forty-six hundredths  
**1.46**

Tell what the 5 means in each number.





7. 31.05      8. 45.2      9. 6.58  
**5 hundredths      5 ones      5 tenths**

Write each amount with a dollar sign and a decimal point.

10. 98¢      11. 16¢  
**\$0.98      \$0.16**
12. Two cents      13. Sixty cents  
**\$0.02      \$0.60**

Compare the decimals.

Use <, >, or =.

14. 2.73  2.75  
**<**
15. 28.30  28.3  
**=**
16. 99.4  99.1  
**>**
17. 5.7  5.70  
**=**

Add.

18.  $\begin{array}{r} 5.2 \\ + 6.8 \\ \hline 12.0 \end{array}$       19.  $\begin{array}{r} 47.07 \\ + 4.19 \\ \hline 51.26 \end{array}$
20.  $3.6 + 5.8$       21.  $0.3 + 12 + 6.5$   
**9.4      18.8**
22.  $\begin{array}{r} 43.2 \\ - 9.7 \\ \hline 33.5 \end{array}$       23.  $\begin{array}{r} 4.04 \\ - 1.05 \\ \hline 2.99 \end{array}$       24.  $\begin{array}{r} 72.6 \\ - 62.8 \\ \hline 9.8 \end{array}$
25.  $58 - 17.31$       26.  $9.46 - 4$   
**40.69      5.46**

Tell whether you add or subtract. Then find the answer.

27. Mark spent \$3.98 for tapes and \$5.25 for a record. How much did he spend in all?  
**Add. \$9.23**
28. Jill ran 6 miles. Anita ran 3.7 miles. How many more miles did Jill run than Anita?  
**Subtract. 2.3 more miles**

Solve each problem.

29. At Ben's hardware store, Al bought 3 gallons of paint, 8.5 feet of wide shelving, and 3.5 feet of narrow shelving. How many feet of shelving did he buy?  
**12.0 feet**
30. A rake weighs 1.8 pounds. A hose weighs 3.5 pounds. A sprinkler weighs 0.76 pounds. What is the difference in weight between a rake and a hose?  
**1.7 pounds**

## Chapter 10 Letter Home

**Keeping You Posted**

We have completed the chapter on decimals in our mathematics textbook. The chapter included exercises like the ones below. You might encourage your child to use decimals by adding the prices of items at the grocery store. We will study fractions next.

To: Family

**H. Brown**

Work each exercise in the top boxes. Find the answers to these exercises in the bottom boxes. Then write the word from the top box in the matching bottom box. You will discover an interesting fact.

|   |   |   |   |   |
|---|---|---|---|---|
| $\begin{array}{r} 25.6 \\ + 31.3 \\ \hline 56.9 \end{array}$    | $\begin{array}{r} 8.6 \\ - 2.4 \\ \hline 6.2 \end{array}$       | $\begin{array}{r} 58.37 \\ - 24.19 \\ \hline 34.18 \end{array}$ | $\begin{array}{r} 46.5 \\ - 38.4 \\ \hline 8.1 \end{array}$ | $\begin{array}{r} 2.43 \\ - 4.88 \\ \hline 73.1 \end{array}$    |
| the   | picture   | Thomas  | camera  | wax   |
| $\begin{array}{r} 71.26 \\ - 34.19 \\ \hline 37.07 \end{array}$ | $\begin{array}{r} 36.41 \\ + 35.27 \\ \hline 71.68 \end{array}$ | $\begin{array}{r} 1.59 \\ + 3.48 \\ \hline 5.07 \end{array}$    | $\begin{array}{r} 3.67 \\ - 2.76 \\ \hline 9.1 \end{array}$ | $\begin{array}{r} 81.43 \\ + 17.75 \\ \hline 99.18 \end{array}$ |
| Edison  | paper   | motion  | and   | invented  |



|        |        |          |         |         |
|--------|--------|----------|---------|---------|
| 34.18  | 37.07  | 99.18    | 73.1    | 71.68   |
| Thomas | Edison | invented | wax     | paper   |
| 9.1    | 56.9   | 5.07     | 6.2     | 8.1     |
| and    | the    | motion   | picture | camera. |

## Chapter 10 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name: \_\_\_\_\_

Write each decimal.

1.       2.   
3. Nine tenths      4. Three and eight tenths  
5. Three hundredths      6. Seven and eleven hundredths

Tell what the 4 means in each number.

7. 75.04      8. 64.8      9. 5.49  
10. 41¢      11. 13¢      12. Seven cents      13. Eighty cents

Write each amount with a dollar sign and a decimal point.

14. 47¢      15. 11.40      16. 55.6      17. 4.1

Compare the decimals. Use <, >, or =.

18. 4.78      19. 11.40      20. 55.6      21. 4.1

Posttest Chapter 10

1. **0.5**      2. **0.71**      3. **0.9**      4. **3.8**      5. **0.03**      6. **7.11**

7. **4 hundredths**      8. **4 ones**      9. **4 tenths**

10. **\$0.41**      11. **\$0.13**      12. **\$0.07**      13. **\$0.80**

14. **<**      15. **=**      16. **>**      17. **=**

Name: \_\_\_\_\_

Add.

18.  $\begin{array}{r} 4.6 \\ + 8.4 \\ \hline 13.0 \end{array}$       19.  $\begin{array}{r} 29.03 \\ + 4.18 \\ \hline 33.21 \end{array}$       20.  $2.8 + 5.6$       21.  $0.5 + 11 + 7.3$   
**13.0      33.21      8.4      18.8**

Subtract.

22.  $\begin{array}{r} 62.4 \\ - 7.9 \\ \hline 54.5 \end{array}$       23.  $\begin{array}{r} 5.08 \\ - 3.09 \\ \hline 1.99 \end{array}$       24.  $\begin{array}{r} 52.3 \\ - 42.9 \\ \hline 9.4 \end{array}$       25.  $84 - 43.69$       26.  $8.73 - 7$   
**54.5      1.99      9.4      40.31      1.73**

Tell whether you should add or subtract. Then find the answer.

27. Hector spent \$3.25 for tapes and \$5.96 for a record. How much did he spend in all?  
**Add. \$9.21**

28. Carey ran 7 miles. Evita ran 2.4 miles. How many more miles did Carey run than Evita?  
**Subtract. 4.6 more miles**

Solve each problem.

29. At Lou's hardware store, Dirk bought 8 gallons of paint, 7.4 feet of wide shelving, and 5.6 feet of narrow shelving. How many feet of shelving did he buy?  
**13.0 feet**

30. A rake weighs 1.7 pounds. A hose weighs 4.2 pounds. A sprinkler weighs 0.83 pounds. What is the difference in weight between a rake and a hose?  
**2.5 pounds**



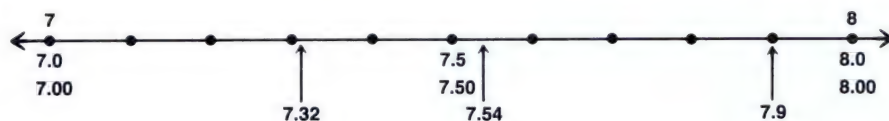
# CHALLENGE

## Rounding Decimals

Round these numbers to the nearest one.

**7.32 7.9 7.54**

In each number, the ones digit is 7, so each number is between 7 and 8.



To round to the nearest one, first look at the tenths digit.

**7.32**

The tenths digit is less than 5.  
The ones digit stays the same.

**7**

**7.9**

The tenths digit is greater than 5.  
Add 1 to the ones digit.

**8**

**7.54**

The tenths digit is 5.  
Add 1 to the ones digit.

**8**

Round each decimal to the nearest one.

- |                        |                       |                        |                        |                        |
|------------------------|-----------------------|------------------------|------------------------|------------------------|
| 1. 6.1<br><b>6</b>     | 2. 6.12<br><b>6</b>   | 3. 6.56<br><b>7</b>    | 4. 6.07<br><b>6</b>    | 5. 6.8<br><b>7</b>     |
| 6. 12.05<br><b>12</b>  | 7. 12.5<br><b>13</b>  | 8. 12.3<br><b>12</b>   | 9. 12.39<br><b>12</b>  | 10. 12.72<br><b>13</b> |
| 11. 9.6<br><b>10</b>   | 12. 9.45<br><b>9</b>  | 13. 9.83<br><b>10</b>  | 14. 9.1<br><b>9</b>    | 15. 9.5<br><b>10</b>   |
| 16. 30.08<br><b>30</b> | 17. 30.8<br><b>31</b> | 18. 30.25<br><b>30</b> | 19. 30.17<br><b>30</b> | 20. 30.71<br><b>31</b> |

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## Challenge

**Estimation** Discuss where each of the three numbers is located on the number line. For each number ask students whether it is closer to 7 or to 8. Ask if numbers with a tenths digit less than 5 are closer to 7 or to 8. [7] Look at other examples to help students decide. Ask if numbers with a tenths digit greater than 5 are closer to 7 or to 8. [8] Look at other examples if necessary. Remind students that the number halfway between 7 and 8, 7.5, is rounded to 8. Ask if other numbers with 5 as the tenths digit are closer to 7 or to 8. [8]

## Answers, page 283

### Calculator

3. Press: 31 + 20 + 97,339 +  
300 =

Display: 97,690

4. Press: 3.1 + 3 + 923 + 2 =  
Display: 931.1

5. Press: 23.3 + 2 - 18.1 =  
Display: 7.2

6. Press: 32 + 21 = × 7 × 2  
× 2 =

Display: 1,484



## Using Problem-Solving Strategies

- Work backward.

### Introduction

To solve this problem, it will be necessary to start with the amount of money that Mark had at the end of the day and work backward, "undoing" each transaction. Students will need to add and subtract decimals.

### Using the Page

Begin by discussing the problem. Ask whether the students think the prices were high or low. See if any students can suggest a way to solve the problem.

Ask how much money Mark had when he got home. [\$4.43] Help students discover that they will *work backward* to find the solution. "How much did the bus ride cost? Give the amount in decimal form. [\$0.75] How much did Mark have before the bus ride?" [\$4.43 + \$0.75 = \$5.18]

"By continuing to work backward, we can find how much money Mark had before Denny paid him \$1.50. Since Mark had \$5.18 after Denny gave him the \$1.50, subtract the \$1.50 to see what he had before getting that money." [\$5.18 - \$1.50 = \$3.68]

"Altogether, Mark paid \$1.65 for his lunch. So add that amount to see what he had before lunch." [\$3.68 + \$1.65 = \$5.33]

"He found \$0.25. Subtract this amount to see what he had before finding it." [\$5.33 - \$0.25 = \$5.08]

"He bought a race car for \$1.12 and 3 puzzle books for \$0.75 each. Altogether that is \$3.37. Add to find what he had before these purchases." [\$5.08 + \$3.37 = \$8.45]

"Then add the money he spent on the first bus ride. [\$8.45 + \$0.75 = \$9.20] This gives the amount that Mark started out with."

To check their work, students could start out with \$9.20, make the transactions and see if they end up with the correct amount, \$4.43, at the end of the problem.

### Follow-Up

Ask students to solve the problem if Mark ended the day with \$2.00. [\$6.77]

Ask them how much he would have had at the end of the day if Mark's parents had given them a ride to and from the shopping center.

## Using Problem-Solving Strategies

# SATURDAY SHOPPING

One Saturday, Mark went shopping with some friends. He rode the bus to the shopping center for 75¢.

Mark bought a miniature race car for \$1.12 and 3 puzzle books for 75¢ each.

He found a quarter outside one of the stores.

The boys ate lunch while they were out. Mark bought a sandwich for \$1.25 and milk for 40¢.

Mark's friend, Denny, talked him into selling his pen. Denny paid Mark \$1.50 for it.

After lunch, Mark rode back home on the bus. The ride cost 75¢.



After Mark got home, he counted his money. He had \$4.43 left. How much money did he start out with? **\$9.20**

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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 407



## Mathematical Background

**Fraction Concepts** For this grade level there are two principal models for a fraction, a part of a whole or a part of a set. It is a good idea to use both models in developing the very important concept of equal fractions.

For example, in the figures below, three fourths of the rectangle on the left is shaded; on the right, six eighths of the rectangle is shaded. Because the shaded regions of the whole are equal, we say that the fractions  $\frac{3}{4}$  and  $\frac{6}{8}$  are equivalent or equal.



Similarly, suppose a class contains 24 students. Three fourths of the class is 18 students, and six eighths of the class is also 18 students. As parts of a set, this illustrates also that  $\frac{3}{4}$  and  $\frac{6}{8}$  are equal.

**Equal Fractions** A procedure for generating equal fractions is based on the principle that the value of a number remains unchanged when multiplying or dividing by 1. Fractions such as  $\frac{3}{3}$ ,  $\frac{8}{8}$ , and  $\frac{15}{15}$  all equal 1. Therefore, when both the numerator and denominator of a fraction are multiplied by 3, 8, or 15, the value of the fraction does not change. Therefore, the following fractions are all equal:

$$\frac{2}{3} = \frac{2 \times 3}{3 \times 3} = \frac{6}{9} = \frac{2 \times 8}{3 \times 8} = \frac{16}{24} = \frac{2 \times 15}{3 \times 15} = \frac{30}{45}$$

Likewise, the numerator and denominator of a fraction can be divided by the same number without changing the value of the fraction.

**Comparing, Adding, and Subtracting** Consider the following fractions:

$$\frac{2}{3}, \frac{3}{4}$$

To compare, add, or subtract, the fractions must have the same denominator—in this case, 12:

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}, \frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

Once  $\frac{2}{3}$  has been changed to  $\frac{8}{12}$  and  $\frac{3}{4}$  has been changed to  $\frac{9}{12}$ , the fractions can easily be compared, added, or subtracted.

## Contents

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## Pretest for Chapter 11

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 11**

Write a fraction to show how much of the figure is shaded.

1. 2. 3. What fraction of the letters are Cs?   
 C C C D D D D D

Write each mixed number.

4. Four and two thirds 5. Eleven and one fourth

Give the length of this segment.

6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262.



# Teaching Chapter 11



## Problem Solving

**Five-Step Method** In this chapter, most students will be solving, for the first time, word problems with fractions. Since some students experience difficulty with fractions, sometime during the PLAN step you might want to encourage students to replace fractions with small whole numbers. Once they develop a plan, students can return to using the fractions during the SOLVE step.

**Problem-Solving Strategies** In previous chapters, students practiced solving problems using the strategies *Draw a picture*, *Use physical models*, and *List all possibilities*. Their practice “pays off” in this chapter, as students discover the helpfulness of these strategies in solving problems involving fractions.

Note that on pages 314–315 students use the strategy *Draw a picture* to solve problems that involve “fraction of,” for example, finding  $\frac{2}{3}$  of 15. (In grade 5, students will learn to solve these problems by multiplying. Meanwhile, such problems are accessible to fourth-graders through the use of the *Draw a picture* strategy.)



## Estimation and Mental Math

**Estimation** In the lesson notes for this chapter, fractions are compared to a reference point— $\frac{1}{2}$ . Students decide whether a given fraction is less than, equal to, or greater than  $\frac{1}{2}$ . If the numerator is less than half the denominator, the fraction is less than  $\frac{1}{2}$ . If the numerator is more than half the denominator, the fraction is greater than  $\frac{1}{2}$ . If the numerator is half the denominator, the fraction is equal to  $\frac{1}{2}$ . For example:

$$4/8 = \frac{1}{2} \quad \text{Half of 8 is 4.}$$

$$4/5 > \frac{1}{2} \quad \text{Half of 5 is between 2 and 3.}$$

$$4/9 < \frac{1}{2} \quad \text{Half of 9 is between 4 and 5.}$$

Students can be shown how to estimate sums of fractions. If a fraction less than  $\frac{1}{2}$  is added to a fraction equal to or less than  $\frac{1}{2}$ , the sum will be less than 1. If a fraction greater than  $\frac{1}{2}$  is added to a fraction greater than or equal to  $\frac{1}{2}$ , the sum will be greater than 1. If one fraction is greater than  $\frac{1}{2}$  and the other is less than  $\frac{1}{2}$ , their sum is greater than  $\frac{1}{2}$ .



## Calculators and Computers

**Calculators** The activity on page 309 shows students how to use a calculator to display a fraction as a decimal. Explain to students that they can show a mixed number as a decimal. Have them write the whole number portion immediately to the left of the decimal point. Then, using a calculator, they should divide the numerator of the fraction portion by the denominator, and write the numbers displayed to the right of the decimal point.

**Computers** The program given on page 317 shows students how to change the given improper fractions into whole numbers. You may want to allow students to try working with improper fractions, which do not yield whole numbers. Should you choose to do this, then discuss the outcome of such experimentation with those who have attempted it. **Additional Resource 116** requires students to write their own program to find fractional parts. Remind students that writing their own program will involve many trials before such a procedure runs smoothly. Encourage them to learn from their mistakes. You may want to suggest that several students work together on this activity.



The teaching of fractions can be made more effective through the use of computer-assisted instruction.



For a general overview of these topics, see pages 436–485.



## Concrete Materials

Throughout this chapter, students will be engaged in group activities involving a variety of concrete materials. These activities are designed to help students understand fraction concepts. Groups of students will form generalizations that lead to a rule for adding and subtracting fractions with the same denominator. With each lesson, allow time for students to work with their materials.

It is very important for students to use concrete materials while they learn how to add and subtract fractions. The fraction models in the Punchouts are excellent for this. Students, individually or in groups, can use the models, adding or removing pieces as indicated. To make pictures of fractions, students can trace the models themselves, or use the frame to do so. After students use the frame to draw the number of circles needed, they should make dots at the points where the tic marks for the fraction they are using are shown on the frame. Then students should connect those dots, so that they form diameters across the circle. Allow students to use objects and to draw pictures as often as they wish. Only when they have developed a clear understanding of this concept through the use of concrete materials and pictures, can students work successfully with the abstract numbers.



Asking the right kinds of questions can encourage higher order thinking skills.



## Teaching Techniques

**Questioning and Responding** Many students have trouble understanding the meaning of fractions. As you ask questions in class, be sensitive to the number of students who are responding. Don't assume that if a few students respond, the whole class understands. Use techniques such as individual private responses written down or whispered to the teacher so that you will be able to check whether each student understands.

**Helping Students Read and Write Mathematics** When students read fractions, note that instead of reading from left to right, they read from top to bottom. Be sure they understand the terms "numerator" and "denominator," so that these terms can be used effectively in class discussion. When students write fractions, check their work to see that they have written fraction bars correctly and positioned digits properly.

**Teaching Students with Special Needs** Acquiring a conceptual base for the meaning of fractions is particularly difficult for low achievers and special education students. Extensive use of concrete materials and drawings is helpful. The learning-disabled students may need to actually feel shaded regions that have been texturized using sand or salt. These students may also have trouble reading and writing fractions. They may perceive a mixed number as a series of digits in a row. Draw attention to the horizontal fraction bar.

**Relating Mathematics to Other Subjects** The following lessons in this chapter have themes that relate mathematics to other school subjects.

Art: art fair (316–317, 320–321)

Health: running (306–307), walking (308–309)

Reading: fantasy (322–323, 324–325)



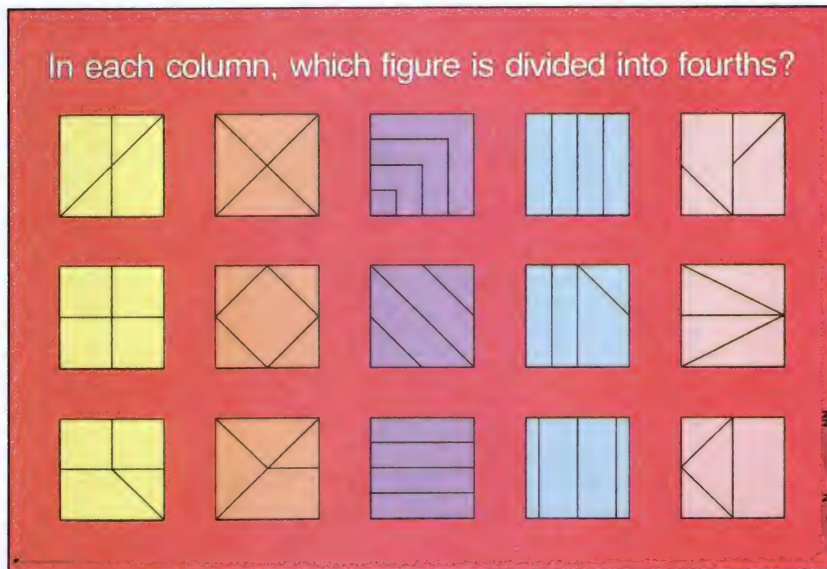
## Thinking Skills

This chapter emphasizes **comprehending concepts** by teaching fraction concepts through concrete materials and pictures. Even the work with different denominators is done through pictures (number lines). The Situational Lesson on page 301 has students **apply concepts** (same size and shape) to solve fraction problems. The *Using Problem-Solving Strategies* features have students **analyze relationships**. Note that page 430 requires students to **make generalizations** by *looking for patterns*.

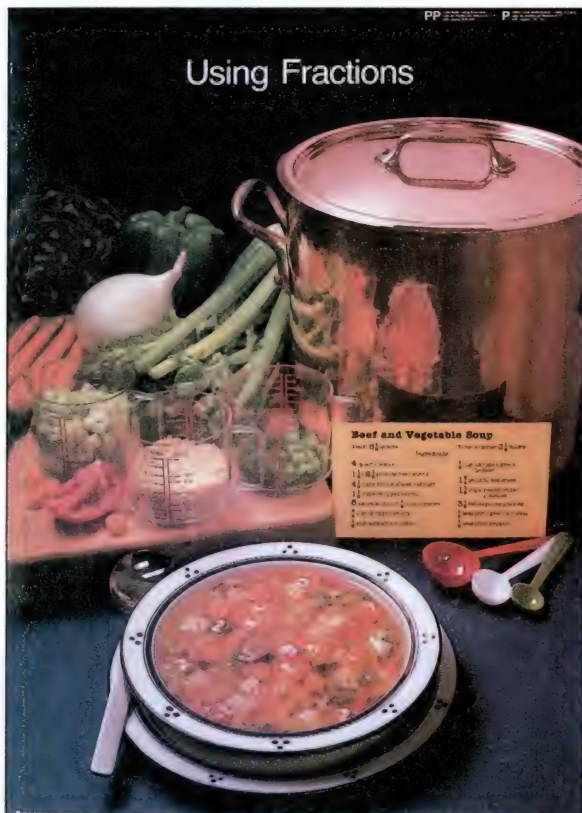


## Bulletin Board Suggestions

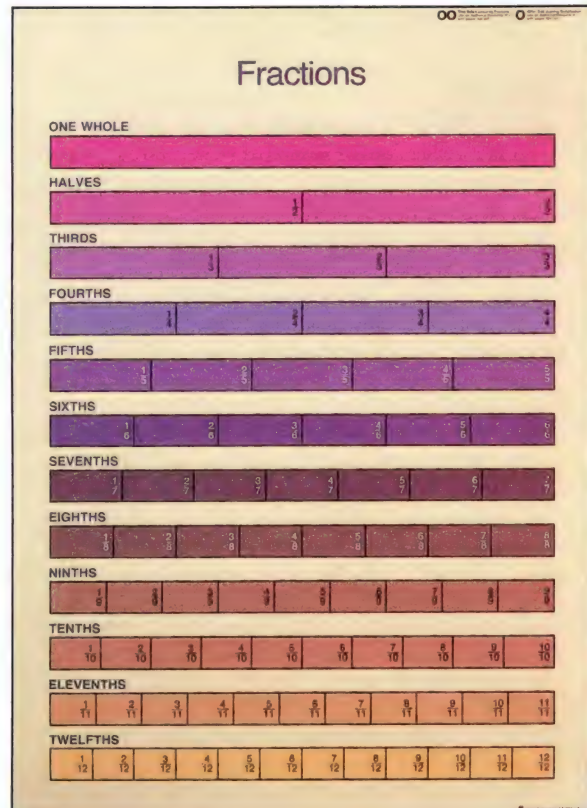
The posters shown here can be used with Chapter 11. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster NN



Math Poster PP



Math Poster OO

## Materials Chapter 11

- Fraction models (Punchouts) 302–303, 308–309, 316–317, 320–323, 326–327
- Commercial grid paper, 20 units by 30 units 302–305
- Counters (Punchouts) 312–315
- Fraction bars (Teaching Aid I or Math Kit) 306–307, 318–319
- Measuring cups (Math Kit) 308–309, 318–319, 322–323
- Inch rulers (Punchouts or Math Kit) 310–311
- Pint, quart containers 318–319
- Water 318–319, 322–323
- Number lines (Teaching Aid A) 320–321, 324–325
- Fraction sets (Math Kit) 322–323
- Computation squares (Teaching Aid D) 322–323



**Basic Situation**

Use the picture on this page as a lead-in to the *Story to Introduce the Situation*. After reading the story, have students work in small groups to design pizzas for their own "Weirdo Pizza" shop. While the pizzas can be any shape, it must be possible to cut each pizza into at least two pieces which are the same size and shape.

**Possible Problems**

- Into how many pieces should the pizzas be cut?
- Must the cuts be straight?
- Must the sides of the pizza be straight?
- Could the pizza have a hole in it, like a tire?
- Could there be more than one way to cut a given pizza into a given number of pieces?

**Indicators of Success**

Students might decide on the number of pieces, then try to draw the pizza and experiment to find pieces with the same size and shape.

Some students may begin cutting apart the proposed shape and use trial and error in attempting to find appropriately shaped pieces.

As students analyze the problem, they may realize that beginning with a particular piece and then duplicating it to form the entire pizza is one way to proceed.

Some students may try to form a shape that can be cut into several different arrangements of pieces.

**Ways to Help**

You might wish to recommend that students use grid paper (Teaching Aid K) to draw pictures of pizzas. They may find it easier to make the pieces the same size and shape using this technique.

If students have trouble getting started, have them look at the shapes on page 203 and discuss whether or not these shapes can be cut into two or more pieces of the same size and shape.

If students design pieces that are not the same size and shape, have them try to verify their results by cutting out the pieces and placing them on top of each other.

As students complete some pizza designs, you may want to display the designs on a bulletin board to provide some ideas for other students.

$$\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$$



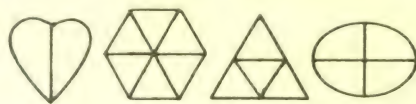
In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

**Story to Introduce the Situation**

You and your fellow classmates have been chosen to live on a new planet named *Congru*. After living there for a while, you become bored because everything is the same size and shape. The houses are all the same size and shape; the flowers are all the same size and shape; and, of course, the pizzas are all the same size and shape. You want to be different, so you and some of your friends open a shop called "Weirdo Pizzas," where the pizzas come in many different shapes. This is a great success. So you open many "Weirdo Pizza" shops which, of course, are all different sizes and shapes.

**Possible Results**

Pizzas with cuts that fit the criteria:



Pizzas with cuts that do not fit the criteria:





## Objective 111 (Target Objective)

Write a fraction for part of a whole.

### Lesson Theme

Consumer Topics: Pizza

### Vocabulary

Denominator, fraction, numerator

### Materials

- Commercial grid paper, 20 units by 30 units
- Fraction models (Punchouts)

## Introduction

**Motivational Situation** Pose this situation to students. Suppose you are working in a pizza parlor as a pizza maker. When would you need to use fractions in your work? [To prepare the dough or sauce, when cutting the pizzas, when planning to make a certain number of pizzas, when planning to put different toppings on part of a pizza]

## Using the Pages

**Teach** *Using Concrete Materials* As students cut and fold their rectangles in Example A, emphasize that they must fold the rectangles into *equal* parts. Discuss the fraction model on page 302. Have students note that the model is separated into 8 equal parts. Explain that 8 is the denominator of the fraction  $\frac{5}{8}$ . Then explain that the numerator, 5, represents the number of equal parts that are shaded. Point out that the fraction is read as "five eighths." Now have students write the fractions that their models represent. Call on students to show their models and say their fractions aloud. Tell students to shade all the parts of their models and to write these new fractions. Point out that the whole model is shaded, and help students to conclude that when the numerator is the same as the denominator, the fraction is equal to 1.

For Example B, write  $0.2 = \frac{2}{10}$  on the chalkboard. Remind students that the decimal and the fraction are both read as "two tenths" and that they name the same part. Then ask students to write the unshaded part of the model in two ways. [ $0.8$ ,  $\frac{8}{10}$ ]

**Practice** For Exercises 1–9, students should note that the rectangles can be folded differently for each exercise as long as they are folded into equal parts. For each exercise, have students count the number of unit squares in each part to show that they are equal.

Students will need their "pizzas" for the next lesson. You might have students place them in envelopes with their names on the envelopes.

(Continued on page 303.)

## Fractions: Part of a Whole

At Perry's Pizza Place you can buy rectangular shaped pizzas that measure 30 inches by 20 inches. Perry cuts the pizzas into equal parts.

**See Using the Pages for a discussion of this example.**

- A.** Work in groups of 4. Each of you cut out a piece of grid paper that is 30 units by 20 units to represent one of Perry's Pizzas. Fold it into equal parts. Open the paper and shade some of the parts. What fraction of your pizza is shaded?

Look at this pizza model.  
You can write a fraction to show that 5 of the 8 equal parts are shaded.



- $\frac{5}{8}$  ← The number of shaded parts is written in the numerator.  
 $\frac{5}{8}$  ← The number of equal parts is written in the denominator.

Now look at your pizza model. How many equal parts are there? How many parts are shaded? What fraction of your pizza is shaded?

Look at your pizza model. What would you write if you shaded all the equal parts? **1**

- B.** Fold another grid paper into ten equal parts. Shade two of the tenths. Write two tenths in two ways.  $\frac{2}{10}$ ; **0.2**

Save your models to use with other lessons in this chapter.

**Practice** Work in groups of 4. Each of you will need 9 sheets of grid paper that are 30 units long and 20 units wide. Each sheet of grid paper represents a whole pizza. For each exercise, you are to fold a new sheet of grid paper into the number of equal pieces indicated.

As you work each exercise, discuss how each person folded his or her paper. Did all of you fold your papers the same way? Could they be folded differently and still show equal parts? How can you be sure that the parts are equal? For each pizza, color one of the equal parts. Then label the shaded part.

- |                                 |                                   |                                   |
|---------------------------------|-----------------------------------|-----------------------------------|
| 1. 2 equal pieces $\frac{1}{2}$ | 2. 3 equal pieces $\frac{1}{3}$   | 3. 4 equal pieces $\frac{1}{4}$   |
| 4. 5 equal pieces $\frac{1}{5}$ | 5. 6 equal pieces $\frac{1}{6}$   | 6. 8 equal pieces $\frac{1}{8}$   |
| 7. 9 equal pieces $\frac{1}{9}$ | 8. 10 equal pieces $\frac{1}{10}$ | 9. 12 equal pieces $\frac{1}{12}$ |

Save your models to use with other lessons in this chapter.

302

## Practice 111

Name \_\_\_\_\_ P111

Give the number of equal parts and tell what they are called.

1. **9, ninths**

2. **10, tenths**

3. **4, fourths**

Does the figure show

4. thirds? **Yes** 5. eighths? **No**

Write a fraction to show how much of the figure is shaded.

6.  **$\frac{1}{2}$**

7.  **$\frac{3}{5}$**

8.  **$\frac{4}{6}$**

9.  **$\frac{0}{8}$**

10.  **$\frac{2}{4}$**

11.  **$\frac{7}{10}$**

Write each fraction.

12. Three fourths  **$\frac{3}{4}$**

13. Five sevenths  **$\frac{5}{7}$**

Write each fraction in words.

14.  $\frac{1}{6}$  **One sixth**

15.  $\frac{2}{9}$  **Two ninths**

## Reteaching 111

Name \_\_\_\_\_ R111

What fraction of the fence is shaded?

Count the parts of the fence that are shaded. **3** — shaded parts  
Count all the parts of the fence. **7** — Number of equal parts  
**Three sevenths of the fence is shaded.**

Write the missing number in each fraction.

1.  **$\frac{2}{4}$**

2.  **$\frac{4}{6}$**

3.  **$\frac{3}{8}$**

Count the shaded bricks. Count all the bricks.  **$\frac{4}{6}$**

Count the broken windows. Count all the windows.  **$\frac{3}{6}$**

Count the shaded parts. Count all the parts.  **$\frac{3}{5}$**

Tell what the equal parts are called.

4. **Ninths**

5. **Eighths**

6. **Sevenths**

Write the fraction for the shaded parts.

7.  **$\frac{1}{2}$**

8.  **$\frac{2}{4}$**

9.  **$\frac{2}{3}$**

10.  **$\frac{3}{6}$**

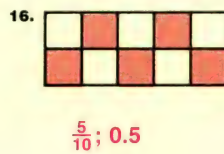
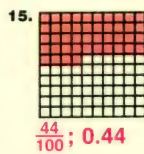
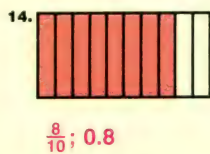
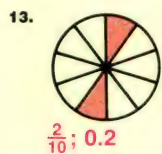
11.  **$\frac{1}{4}$**

12.  **$\frac{3}{8}$**

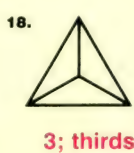


10. Use a circular model to draw a circle. Cut it out. Fold the circle in half. Shade one half of it. **See margin.**
11. Draw a triangle with two equal sides. Fold the triangle in half. Shade one half of it. **See margin.**
12. Compare your models for Exercises 1, 10, and 11. What did you do to each model? Did the shaded parts look the same? Explain. **See margin.**

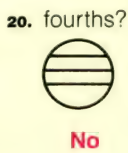
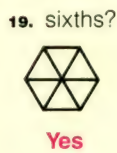
Write a fraction and a decimal to show how much of the figure is shaded.



Give the number of equal parts and tell what they are called.



Does the figure show



**Apply** Work in groups of 4. Each of you will need several sheets of grid paper that measure 30 units by 20 units.

21. How many different ways can your group fold the grid paper to show four equal parts? Each person in the group should try to fold his or her sheet of grid paper to show fourths in a way that is different from the others. Count the unit squares in one fourth. Compare your count with others in your group. Are they the same? Why or why not?  
**There are 150 unit squares in every one fourth.**
22. Repeat Problem 21 with each of you folding a paper into ten equal parts.  
**There are 60 unit squares in every one tenth.**
23. Using the information from Problems 21 and 22, make a generalization about the number of unit squares you could expect to find in each part if you fold one of the grid papers in 12 equal parts. Then check your generalization by folding the grid paper and counting the unit squares in one twelfth.  
**See margin.**

More Practice Set 111, page 391 303

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–23 |
| average  | 1–23 |
| enriched | 1–23 |

More Practice Set 111,  
page 391

(Continued from page 302.)

Have students explain that the figure in Exercise 20 does not show fourths because the parts are not equal.

**Apply Problem Solving** For Problem 21, students should be able to fold the paper in at least four different ways.

## Follow-Up

**Extra Practice** Give half of the students cards showing pictures with fractions. Give the other students cards with fractions naming those pictures. Let each student find another student with a matching picture or fraction.

**Enrichment Use data from outside the text** Have students look in books to find colored pictures of flags of different countries and tell the class how the fractional parts of the flags are colored. For example, a flag is  $\frac{1}{3}$  green, or a flag is  $\frac{3}{4}$  black.






**Computer Assisted Instruction**  
Mathematics Courseware Series  
• Fractions 1, Activity 1

## Enrichment 111

Name \_\_\_\_\_ E111

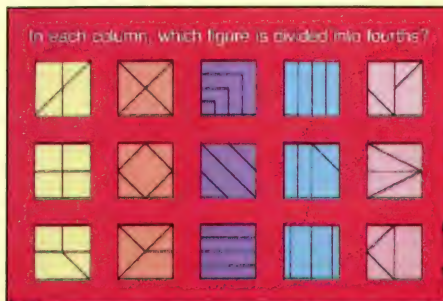
**Broken Boxes**

When these boxes are unfolded they look like the patterns shown in heavy lines on the grids. Write the fraction of each grid that is covered by the unfolded box.

-   
 $\frac{3}{2}$
-   
 $\frac{3}{3}$
-   
 $\frac{7}{15}$
-   
 $\frac{5}{9}$
-   
 $\frac{7}{12}$

Use a heavy line to draw patterns on these grids to show what each box would look like when it is unfolded. Then write the fraction of the grid that was used.

## Additional Resource 111





**Math Poster NN Fractions: Part of a Whole** From left to right, by columns, the middle, top, bottom, top, and middle figure is the one that is divided into fourths. See Answer Key and Notes for Teacher's Resource File for extensions and uses of the poster to review angles, polygons, congruent segments, and congruent polygons.

## Daily Maintenance

**Mental Math** Encourage students to do these exercises mentally.

- $180 \div 9$  [20]
- $360 \div 4$  [90]
- $600 \div 5$  [120]
- $720 \div 8$  [90]
- $350 \div 7$  [50]
- $420 \div 6$  [70]

Answers, page 303

10.  11. 

- Each model was folded to show two equal parts and one part was shaded to show  $\frac{1}{2}$  the model. The shaded parts look different because the whole models have different shapes and sizes.
- The number of unit squares in each part can be determined by dividing the number of unit squares in the whole sheet by the number of parts. There are 50 units in each twelfth.



## Objective 112 (Target Objective)

Write a fraction for part of a set.

### Lesson Theme





Consumer Topics: Pizza

### Materials

- Grid paper "pizzas" from previous lesson

## Introduction

**Warm-Up Review** Have students write each decimal.

1.  [0.4] 2.  [0.7]
3.  [0.6] 4.  [0.5]

## Using the Pages

**Teach Using Concrete Materials** Allow students to work Example A on their own. Then explain that a group of objects is called a *set*. Further explain that students can express any part of a set of objects as a fraction. For Example A, pairs of students pool the "pizza" models they made in the previous lesson. Point out that before they can write the fraction that represents cheese pizzas, they need to know how many pizzas there are in the whole set of pizzas. Ask students which part of the fraction names the number of objects in the whole set [Denominator] and which names the number of specific items. [Numerator] Extend this activity by asking what fraction of all the pizzas are sausage pizzas. [Answers will vary.] Students should explain that in the previous lesson, they identified a fraction of a whole; in this lesson, they are naming a fraction of a set. You might ask students to give examples of a fraction of a pizza and the same fraction of a set of pizzas.

For Example B, have students draw pictures to illustrate a part of a whole and a part of a set. For example:

$$\frac{1}{3} \quad \begin{array}{|c|c|c|} \hline \text{shaded} & & \\ \hline \end{array} \quad \frac{1}{3} \quad \begin{array}{c} \bigcirc \\ \bigcirc \\ \bigcirc \end{array}$$

**Try** For Exercise h, point out that students can write a fraction for the whole set and for zero parts of the set.

**Practice** Have students write the fractions for Exercises 5–10.

**Apply Problem Solving** Students will need to add to find the total number of objects in the set before they can name the fraction in Problem 14.

## Fractions: Part of a Set

See *Using the Pages* for a discussion of these examples.

- a. Work with another student. You will each need your "pizzas" from Perry's that you made for the previous lesson.

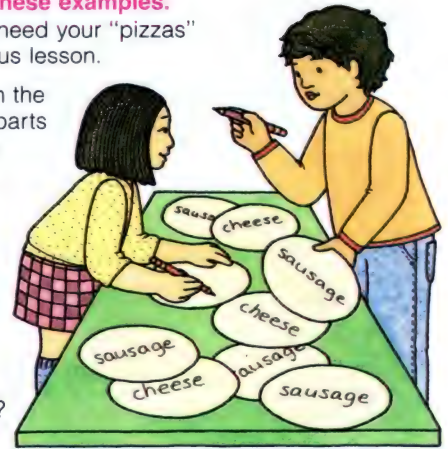
Place all of the pizzas in front of you. Turn the pizzas over so that there are no shaded parts showing. On some of the pizzas write the word *cheese*. On the rest of them, write the word *sausage*. Take some of each kind of pizza. What fraction of the pizzas that you took are cheese?

- ← Number of cheese pizzas  
← Number of pizzas

Take some more of each kind of pizza. Put them with the other pizzas you took. What fraction of these pizzas are cheese?

Take all of the pizzas that both of you have. What fraction of them are cheese?

How is what you have just done different from what you did with the pizzas in the previous lesson?



- b. Give an example that shows a fraction of a whole.  
Give an example that shows a fraction of a set.  
Show and explain your examples to another student.

**Try** What fraction of the

- a. fruit are apples?  $\frac{1}{4}$



- b. letters are As?  $\frac{2}{10}$



For Exercises c–g, tell if the items are a fraction of a set or a fraction of a whole.

- c. A piece of cake      d. Six apples out of twelve apples      e. Half a fish  
**Fraction of a whole**      **Fraction of a set**      **Fraction of a whole**
- f. Two cans from a six-pack of apple juice      g. Three red squares on a checkerboard  
**Fraction of a set**      **Fraction of a whole**
- h. Perry had an order for 5 pepperoni pizzas. What fraction of the pizzas were pepperoni pizzas? sausage pizzas?  $\frac{5}{5}$ ;  $\frac{0}{5}$

304

## Practice 112

Name \_\_\_\_\_ P112

Write what fraction of the foods are

1. ears of corn  $\frac{4}{10}$

2. carrots  $\frac{2}{10}$

3. bananas  $\frac{10}{10}$

4. pineapples  $\frac{1}{10}$

5. vegetables  $\frac{6}{10}$

6. baseball gloves  $\frac{2}{9}$

7. footballs  $\frac{1}{9}$

8. tennis rackets  $\frac{9}{9}$

9. football helmets  $\frac{3}{9}$

10. baseballs  $\frac{0}{9}$

Write what fraction of the letters A, E, I, O, and U are vowels.

11. penguins  $\frac{3}{8}$

12. elephants  $\frac{2}{8}$

13. beavers  $\frac{3}{8}$

14. tigers  $\frac{0}{8}$

15. HALF  $\frac{1}{2}$

16. FOURTH  $\frac{1}{4}$

17. FIFTH  $\frac{1}{5}$

18. SEVENTH  $\frac{1}{7}$

19. MATHEMATICS  $\frac{11}{19}$

20. ARITHMETIC  $\frac{10}{20}$

## Reteaching 112

Name \_\_\_\_\_ R112

What fraction of the squares are shaded?

Count the number of shaded squares: 3

Count the number of squares: 7

Number of shaded squares → 3 — numerator  
Number of squares → 7 — denominator

$\frac{3}{7}$  of the squares are shaded


Circle the numerator in each fraction.


1.  $\frac{3}{7}$  2.  $\frac{2}{9}$  3.  $\frac{5}{8}$  4.  $\frac{10}{12}$  5.  $\frac{4}{6}$


Circle the denominator in each fraction.


6.  $\frac{3}{7}$  7.  $\frac{2}{9}$  8.  $\frac{5}{8}$  9.  $\frac{10}{12}$  10.  $\frac{4}{6}$


Tell what fraction of the shapes are shaded.


11.   $\frac{1}{3}$

12.   $\frac{1}{2}$

13.   $\frac{1}{4}$

14.   $\frac{1}{2}$

15.   $\frac{3}{6}$

16.   $\frac{5}{10}$



## Practice What fraction of the

1. books are closed?  $\frac{2}{3}$



2. balls are basketballs?  $\frac{2}{5}$



3. crayons are blue?  $\frac{1}{4}$



4. coins are pennies?  $\frac{2}{5}$



For Exercises 5–10, tell if the fraction is a fraction of a set or a fraction of a whole.

- |  |  |   |
|--|--|---|
| 5. One fourth of an apple<br><b>Fraction of a whole</b>      | 6. Two thirds of the records in a collection<br><b>Fraction of a set</b> | 7. Four fifths of the pennies in a bank<br><b>Fraction of a set</b> |
| 8. Four tenths of a lawn mowed<br><b>Fraction of a whole</b> | 9. Three fourths of the checkers in a game<br><b>Fraction of a set</b>   | 10. Half of a carton of milk<br><b>Fraction of a whole</b>          |

## Apply Solve each problem.

- |  |   |
|--|---|
| 11. What fraction of the letters in the word CALIFORNIA are As?<br>$\frac{2}{10}$  | 12. What two letters are each $\frac{4}{11}$ of the letters in the word MISSISSIPPI?<br><b>I, S</b>   |
| 13. Perry cut a pizza into ten equal slices. Nine of them were eaten. What fraction of the pizza was not eaten? Write your answers as a fraction and as a decimal.<br>$\frac{1}{10}$ ; 0.1 | 14. One night Perry delivered a total of 15 cheese pizzas, 34 sausage pizzas, 48 pepperoni pizzas, and 23 other kinds. What fraction of the delivered pizzas were cheese?<br>$\frac{15}{120}$ |
| 15. Take a survey in your class. Have everyone name his or her favorite kind of pizza. Picture this information and write the fractions that are used.<br><b>Answers will vary.</b>        |   |

More Practice Set 112, page 391 305

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–15 |
| average  | 1–15 |
| enriched | 1–15 |

More Practice Set 112, page 391

## Follow-Up

### Reteaching Using Concrete Materials

Choose 4 students to come to the front of the class. Explain that fractions can describe part of a set—in this case, a set of four students. Ask class what fraction 1 [ $\frac{1}{4}$ ], 2 [ $\frac{2}{4}$ ], 3 [ $\frac{3}{4}$ ], and 4 [ $\frac{4}{4}$ ] of the students represent, and write the fractions on the chalkboard.

Then have eight students stand in front of the class. Ask questions about the students that require fractions as answers, including questions such as what fraction are boys, what fraction are girls, what fraction are wearing slacks, and what fraction have brown eyes. Include some questions that require  $\frac{0}{8}$  and  $\frac{8}{8}$  answers.

**Enrichment** Have students list the letters of the alphabet, write a different word for each letter, and write the fraction that tells how many times the letter appears in the word. [Example: A, banana,  $\frac{3}{6}$ ]

### Reading and Writing Mathematics

Write the following fractions on the board. Have students give the numerator and the denominator of each fraction.  $\frac{1}{3}$  [The numerator is 1, and the denominator is 3.]  $\frac{7}{22}$  [The numerator is 7, and the denominator is 22.]  $\frac{3}{4}$  [The numerator is 3, and the denominator is 4.]

### Computer Assisted Instruction

Mathematics Courseware Series

- Fractions 1, Activity 2

## Enrichment 112

Name: \_\_\_\_\_ E112

**Mix and Match**

Use the pictures to answer the questions.

- What fraction of the mugs have flowers?  $\frac{1}{5}$
- What fraction have names?  $\frac{4}{5}$
- What fraction have handles?  $\frac{12}{12}$
- What fraction have stripes?  $\frac{1}{6}$
- What fraction have squares?  $\frac{0}{5}$

Use the pictures to answer the questions.

- What fraction of the items are liquids?  $\frac{1}{3}$
- What fraction are not liquids?  $\frac{2}{3}$
- What fraction are things that grow in a garden?  $\frac{2}{9}$

## Additional Resource 112

Name: \_\_\_\_\_ Additional Resource 112

**Computer BASIC: Multiple INPUT Statements**

You can use more than one INPUT statement in a program. A different letter should be used for each INPUT instruction.

Type and run each program and show the output.

```

1. 10 REM ADDING INPUT
    20 PRINT "ENTER FIRST NUMBER"
    30 INPUT A
    40 PRINT "ENTER SECOND NUMBER"
    50 INPUT B
    60 PRINT "THE SUM IS "; A+B
    70 END
2. 10 REM MULTIPLYING INPUT
    20 PRINT "ENTER FIRST NUMBER"
    30 INPUT A
    40 PRINT "ENTER SECOND NUMBER"
    50 INPUT B
    60 PRINT "THE PRODUCT IS "; A*B
    70 END
3. Type and run this program. Show some of your input and its output.
    10 PRINT "ENTER 2 DECIMALS"
    20 PRINT "LARGER DECIMAL FIRST"
    30 INPUT X,Y
    40 PRINT "SUM "; X+Y
    50 PRINT "DIFFERENCE "; X-Y
    60 GOTO 10
    70 END
  
```

| Input (line 30) | Sum (line 40) | Difference (line 50) |
|-----------------|---------------|----------------------|
| 1.53 71         | 2.24          | 82                   |
| 89 14           | 1.03          | 75                   |
| 2.36 1.47       | 3.83          | 89                   |
| 08 069          | 142           | 818                  |
| 3.6 1.35        | 4.95          | 2.25                 |

Answers will vary. Sample answers are given.

### Daily Maintenance

**Estimation** Have students estimate if each sum will be greater than or less than 50.

- $8 + 4 + 13$  [ $\leq$ ; 25]
- $15 + 14 + 10$  [ $\leq$ ; 39]
- $23 + 18 + 31$  [ $>$ ; 72]
- $26 + 9 + 11$  [ $\leq$ ; 46]
- $19 + 20 + 21$  [ $>$ ; 60]
- $35 + 6 + 30$  [ $>$ ; 71]



## Objective 113

Compare two fractions and compare a fraction with 1.

### Lesson Theme

Health: Running

### Materials

- Fraction Bars (Math Kit)

## Introduction

**Using Concrete Materials** Write the fractions  $\frac{1}{3}$  and  $\frac{1}{4}$  on the board. Have a student place the fraction bar of  $\frac{1}{3}$  next to the fraction bar of  $\frac{1}{4}$ . Ask students which fraction is greater. [ $\frac{1}{3}$ ]. Point out that the marked section of  $\frac{1}{3}$  is larger than that of  $\frac{1}{4}$ . Repeat this activity with the fractions  $\frac{1}{2}$  and  $\frac{2}{4}$ . The two fraction bars will have the same area marked and therefore these fractions are equal. Repeat this activity with other pairs of fractions.

## Using the Pages

**Teach** In Example A, make sure students know how to read "zero eighths" and "eight eighths." Emphasize that only when the denominators of two fractions are the same can students compare the fractions by comparing the numerators. Remind students that in comparing two fractions on the number line, the fraction to the right is greater and the fraction to the left is lesser.

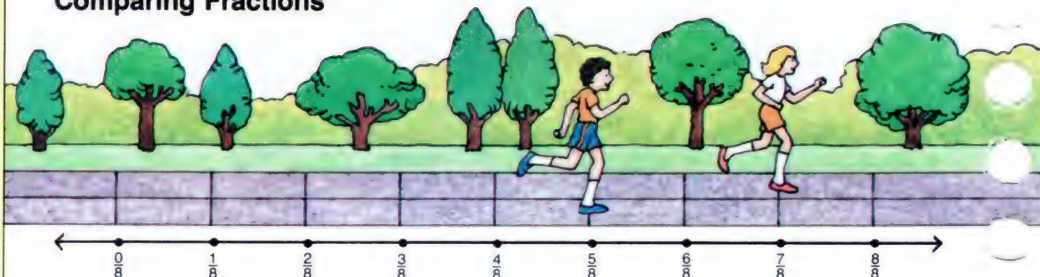
For Example B, have students look at the number lines. Ask them what they notice about all the numerators of the fractions that appear to the left of one on the number line, [The numerators are less than the denominators.] at one on the number line, [The numerators and denominators are equal.] and to the right of one on the number line [The numerators are greater than the denominators.].

**Try** For Exercises a–i, encourage students to identify whether each of the fractions to be compared is greater than, less than, or equal to one.

**Practice Error Analysis** In Exercises 11–20, watch for students who look only at the numerator or the denominator to decide which is the greater. Explain to these students that when they are comparing two fractions they should always compare the denominators first. If the denominators are the same, then they can compare the numerators. If the denominators are different, however, they must find the two fractions on the number lines to compare them.

(Continued on page 307.)

## Comparing Fractions



- A. In a timed run, Gwen ran  $\frac{7}{8}$  mile and Leon ran  $\frac{5}{8}$  mile. Who ran farther, Gwen or Leon?

Compare  $\frac{5}{8}$  and  $\frac{7}{8}$ .

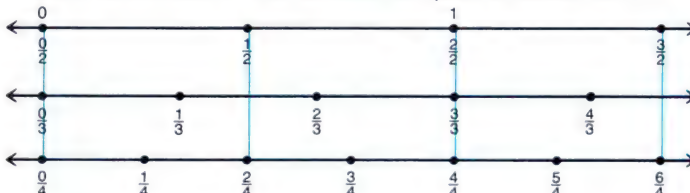
Look at the number line above.  $\frac{7}{8}$  is to the right of  $\frac{5}{8}$ , so  $\frac{7}{8}$  is greater than  $\frac{5}{8}$ .

Now look at the fractions. The denominators are the same. To compare fractions with the same denominator, you only need to compare their numerators.

$$\frac{5}{8} < \frac{7}{8} \quad 5 \text{ is less than } 7. \quad \frac{7}{8} > \frac{5}{8} \quad 7 \text{ is greater than } 5.$$

Gwen ran the farthest.

- B. Using number lines, you can compare fractions that have different denominators. You can also compare a fraction with 1.



| To compare                      | Locate   | Think                                       | Write                       |
|---------------------------------|--|---|-----------------------------|
| $\frac{1}{2}$ and $\frac{1}{3}$ | $\frac{1}{2}$ is to the left of $\frac{1}{3}$  | $\frac{1}{2}$ is less than $\frac{1}{3}$    | $\frac{1}{2} < \frac{1}{3}$ |
| $\frac{4}{5}$ and $\frac{6}{5}$ | $\frac{4}{5}$ is to the right of $\frac{6}{5}$ | $\frac{4}{5}$ is greater than $\frac{6}{5}$ | $\frac{4}{5} > \frac{6}{5}$ |
| $\frac{1}{2}$ and $\frac{2}{4}$ | $\frac{1}{2}$ lines up with $\frac{2}{4}$      | $\frac{1}{2}$ is equal to $\frac{2}{4}$     | $\frac{1}{2} = \frac{2}{4}$ |
| $\frac{4}{5}$ and 1             | $\frac{4}{5}$ is to the right of 1             | $\frac{4}{5}$ is greater than 1             | $\frac{4}{5} > 1$           |

306

## Practice 113

Name \_\_\_\_\_ P113

Use the number lines to compare the fractions. Use  $<$ ,  $>$ , or  $=$ .

1.  $\frac{1}{2}$  and  $\frac{1}{3}$       2.  $\frac{1}{2}$  and  $\frac{1}{4}$       3.  $\frac{3}{4}$  and  $\frac{1}{2}$       4.  $\frac{3}{4}$  and  $\frac{1}{4}$

5.  $\frac{3}{4}$  and  $\frac{1}{2}$       6.  $\frac{1}{2}$  and  $\frac{1}{3}$       7.  $\frac{1}{2}$  and  $\frac{1}{4}$       8.  $\frac{3}{4}$  and  $\frac{1}{4}$

9.  $\frac{1}{2}$  and  $\frac{1}{3}$       10.  $\frac{2}{3}$  and  $\frac{1}{2}$       11.  $\frac{2}{3}$  and  $\frac{1}{4}$       12.  $\frac{1}{3}$  and  $\frac{1}{2}$

Color fractions less than 1 green, fractions equal to 1 black, and fractions greater than 1 yellow. You will see the flag of Jamaica.

## Reteaching 113

Name \_\_\_\_\_ R113

Compare  $\frac{1}{2}$  and  $\frac{1}{3}$ .

$\frac{1}{2}$  is to the left of  $\frac{1}{3}$ .  
 $\frac{1}{2}$  is less than  $\frac{1}{3}$ .  
 $\frac{1}{2} < \frac{1}{3}$

Use the number lines above to compare the fractions. Write  $<$ ,  $>$ , or  $=$  in each circle.

1.  $\frac{1}{2}$  and  $\frac{1}{3}$       2.  $\frac{1}{2}$  and  $\frac{1}{4}$       3.  $\frac{3}{4}$  and  $\frac{1}{2}$       4.  $\frac{3}{4}$  and  $\frac{1}{4}$

5.  $\frac{3}{4}$  and  $\frac{1}{2}$       6.  $\frac{1}{2}$  and  $\frac{1}{3}$       7.  $\frac{1}{2}$  and  $\frac{1}{4}$       8.  $\frac{3}{4}$  and  $\frac{1}{4}$

9.  $\frac{1}{2}$  and  $\frac{1}{3}$       10.  $\frac{2}{3}$  and  $\frac{1}{2}$       11.  $\frac{2}{3}$  and  $\frac{1}{4}$       12.  $\frac{1}{3}$  and  $\frac{1}{2}$

13.  $\frac{1}{2}$  and  $\frac{1}{3}$       14.  $\frac{1}{2}$  and  $\frac{1}{4}$       15.  $\frac{3}{4}$  and  $\frac{1}{2}$       16.  $\frac{3}{4}$  and  $\frac{1}{4}$

Shade each region that contains a fraction greater than 1. You will see a pattern.



**Try** Compare the fractions. Use  $<$  or  $>$ .

- a.  $\frac{3}{4}$   $\frac{5}{4}$   $<$     b.  $\frac{1}{2}$   $\frac{0}{2}$   $>$     c.  $\frac{7}{12}$   $\frac{10}{12}$   $<$     d.  $\frac{8}{7}$   $\frac{10}{7}$   $<$

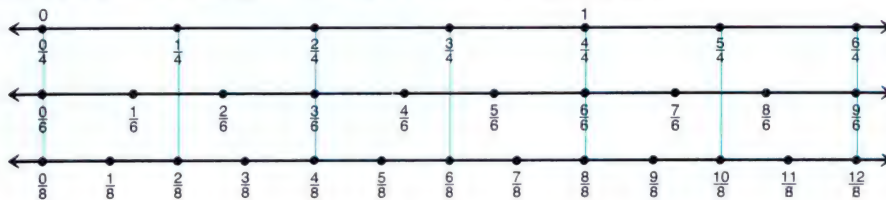
Use the number lines in Example B to compare the fractions. Use  $<$ ,  $>$ , or  $=$ .

- e.  $\frac{2}{3}$   $\frac{1}{2}$   $>$     f.  $\frac{6}{4}$   $\frac{2}{2}$   $=$     g.  $1$   $\frac{4}{3}$   $<$     h.  $\frac{3}{4}$   $\frac{4}{3}$   $<$     i.  $\frac{3}{3}$   $\frac{4}{4}$   $=$

**Practice** Compare the fractions. Use  $<$  or  $>$ .

1.  $\frac{5}{8}$   $\frac{3}{8}$   $>$     2.  $\frac{1}{4}$   $\frac{0}{4}$   $>$     3.  $\frac{2}{8}$   $\frac{4}{8}$   $<$     4.  $\frac{7}{10}$   $\frac{9}{10}$   $<$     5.  $\frac{5}{2}$   $\frac{2}{2}$   $>$   
6.  $\frac{0}{8}$   $\frac{5}{8}$   $<$     7.  $\frac{6}{3}$   $\frac{3}{3}$   $>$     8.  $\frac{4}{4}$   $\frac{4}{3}$   $>$     9.  $\frac{11}{12}$   $\frac{14}{12}$   $<$     10.  $\frac{6}{6}$   $\frac{5}{3}$   $>$

Use the number lines to compare the fractions. Use  $<$ ,  $>$ , or  $=$ .



11.  $\frac{0}{4}$   $\frac{1}{8}$   $<$     12.  $\frac{3}{8}$   $\frac{2}{4}$   $=$     13.  $\frac{7}{8}$   $\frac{4}{3}$   $>$     14.  $\frac{2}{8}$   $\frac{4}{3}$   $<$     15.  $\frac{0}{4}$   $\frac{0}{8}$   $=$   
16.  $\frac{1}{4}$   $\frac{1}{8}$   $>$     17.  $\frac{7}{8}$   $\frac{0}{8}$   $>$     18.  $\frac{4}{8}$   $\frac{0}{3}$   $=$     19.  $\frac{5}{8}$   $\frac{5}{4}$   $<$     20.  $\frac{4}{4}$   $\frac{6}{6}$   $=$

Compare each fraction with 1. Use  $<$ ,  $>$ , or  $=$ .

21.  $\frac{5}{4}$   $1$   $>$     22.  $\frac{3}{3}$   $1$   $=$     23.  $\frac{2}{3}$   $1$   $<$     24.  $\frac{0}{6}$   $1$   $<$     25.  $\frac{7}{2}$   $1$   $>$

Work with another student. Study your answers to Exercises 21–25.

By just looking at a fraction, how can you tell if it is **See margin.**

26. less than 1?    27. equal to 1?    28. greater than 1?    29. equal to 0?

**Apply** Solve each problem.

30. Todd ran  $\frac{2}{3}$  mile and Jason ran  $\frac{3}{4}$  mile. Who ran the farthest?  
**Jason**  
31. Alice ran  $\frac{3}{4}$  mile. Martha ran  $\frac{5}{8}$  mile. Sandy ran  $\frac{5}{8}$  mile. Who ran the farthest? Who was second?  
**Martha; Alice**

More Practice Set 113, page 392 307

## Assignment Guide

|          |                         |
|----------|-------------------------|
| basic    | 1–20 odd or even, 21–30 |
| average  | 1–20 odd or even, 21–30 |
| enriched | 1–31                    |

**More Practice Set 113,**  
page 392

**Homework to do with others** Have students discuss the following problem with an adult: At a school picnic 96 fourth-graders entered a race. Two students ran at a time and one was eliminated. How many times did a student run and win to be among the three finalists? [5] Ask students to record the strategy they used and the solution.

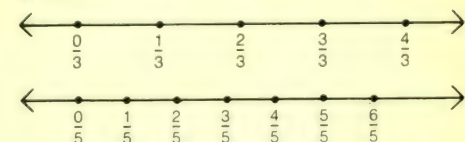
(Continued from page 306.)

**Apply Problem Solving** For Problems 30 and 31, have students use the number lines on pages 306–307 to help them solve the problems.

## Follow-Up

**Extra Practice Estimation** Have students decide if each fraction in Exercises 1–13 is greater than, less than, or equal to  $\frac{1}{2}$ . Help students understand that a fraction is less than  $\frac{1}{2}$  if the denominator is greater than twice the numerator, and greater than  $\frac{1}{2}$  if the denominator is less than twice the numerator.

Have students draw the following number lines to do the exercises below them.



- $\frac{0}{3}$   $\frac{1}{3}$  [ $<$ ]     $\frac{2}{3}$   $\frac{2}{3}$  [ $>$ ]     $\frac{5}{3}$   $\frac{3}{3}$  [ $=$ ]  
 $\frac{4}{3}$   $\frac{5}{3}$  [ $>$ ]     $\frac{4}{3}$   $\frac{2}{3}$  [ $>$ ]     $\frac{1}{3}$   $\frac{2}{3}$  [ $<$ ]

## Enrichment 113

Name \_\_\_\_\_ E113

**Fraction Game**

Bill and Judy played a fraction comparison game. On each play, they both drew a pair of number cards and formed a fraction less than or equal to 1.

They used the fraction strips on the right to help decide which fraction was greater.

The player with the greater fraction scored a point.

Decide who scored on each play. Circle the winning cards.

1. Bill  $\frac{5}{8}$  Judy  $\frac{2}{5}$     2. Bill  $\frac{4}{9}$  Judy  $\frac{7}{9}$

3. Bill  $\frac{1}{3}$  Judy  $\frac{2}{8}$     4. Bill  $\frac{5}{6}$  Judy  $\frac{7}{9}$

Make a set of cards and play this game with a friend.

Use the fraction strips on this page to help you decide which fraction is greater.

## Additional Resource 113



**Math Poster OO Comparing Fractions** Use this poster as a teaching display to give students a model for fractions. See Answer Key for activities and other uses.

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil. Then have pairs of students compare to see if they made the same choices.

1.  $\$6.48 \div 2$  [ $\$3.24$ ]  
2.  $\$8.96 \div 4$  [ $\$2.24$ ]  
3.  $\$9.72 \div 9$  [ $\$1.08$ ]  
4.  $\$8.32 \div 2$  [ $\$4.16$ ]  
5.  $\$5.95 \div 5$  [ $\$1.19$ ]  
6.  $\$9.21 \div 3$  [ $\$3.07$ ]



## Objective 114

Write mixed numbers and/or improper fractions.

### Lesson Theme

Health: Walking

### Vocabulary

Mixed numbers

### Materials

- Fraction models (Punchouts)
- Measuring cups

## Introduction

**Using Concrete Materials** Use a measuring cup to review the idea of a fraction and its numerator and its denominator. Show the cup  $\frac{2}{3}$  full,  $\frac{1}{4}$  full, and so on. Have students pour from one cup to another to see how many third cups or quarter cups it takes to fill 1 cup. Discuss the fact that both  $\frac{3}{3}$  and  $\frac{4}{4}$  are equal to 1.

## Using the Pages

**Teach** **Using Concrete Materials** In Example A, if students have trouble writing a number sentence, point out that in Steps 1 and 2, they were dealing with wholes and fractional parts, and that Steps 3 and 4 dealt with fractional parts alone. In Example B, ask students to explain why these types of numbers are called mixed numbers. [They are made up of a whole number and a fraction.]

**Try** In Exercise b, be sure students understand that a shaded circle represents 1 "whole," and that 2 "wholes" plus  $\frac{2}{3}$  of a "whole" can be written  $2\frac{2}{3}$ .

**Practice** For Exercise 7, remind students that when sketching a whole divided into its fractional parts, they should represent the parts equally.

Be sure students understand how to mark a number line using mixed numbers. You might want to ask students to mark a number line in eighths between 0 and 4 using fractions and mixed numbers.

**Error Analysis** In Exercises 8–11, watch for students who have difficulty writing a fraction for each picture. Explain that when a fraction is greater than 1, the numerator will always be greater than the denominator.

## Mixed Numbers

- A. Mr. and Mrs. Sengle walk  $1\frac{3}{4}$  miles every day. How many fourths is this?

Work with two other students. Use your punchout fraction models and take turns working steps 1–4.



**Step 1** Fill in one circle of the fraction model frame with 4 of the fourths.

**Step 2** Fill in another circle with 3 of the fourths.

$1\frac{3}{4}$  circles are filled in the frame.

**Step 3** Remove the frame and separate the parts that formed  $1\frac{3}{4}$  circles.

**Step 4** Count the number of fourths. How many fourths were used in all?

**7 fourths**

Write a number sentence that relates Steps 1 and 2 with Steps 3 and 4.

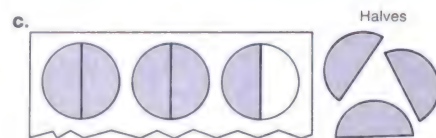
$$1\frac{3}{4} = \frac{7}{4}$$

- B. Numbers like  $1\frac{3}{4}$  are *mixed numbers*.

A mixed number is made up of a whole number and a fraction.

$$1\frac{3}{4}$$

whole number    fraction  
one and three fourths



In this model, two and one half circles are filled in. The circles are divided into halves. Five halves are used in all.

$$2\frac{1}{2} = \frac{5}{2}$$

### Try

- a. Use your punchout fraction models to show three and one fourth as a mixed number. Write the mixed number.

**See margin.**

308

## Practice 114

**P114**

Write a fraction and a mixed number for each picture.

1.  $\frac{3}{4}$

2.  $\frac{3}{4}$

3.  $\frac{5}{8}$

4.  $\frac{5}{8}$

5.  $\frac{9}{12}$

6.  $\frac{9}{12}$

7.  $\frac{11}{16}$

8.  $\frac{11}{16}$

9.  $\frac{15}{20}$

10.  $\frac{15}{20}$

11.  $\frac{18}{24}$

12.  $\frac{18}{24}$

Write a fraction and a mixed number for each picture.

13.  $\frac{3}{4}$

14.  $\frac{3}{4}$

15.  $\frac{5}{8}$

16.  $\frac{5}{8}$

17.  $\frac{9}{12}$

18.  $\frac{9}{12}$

19.  $\frac{11}{16}$

20.  $\frac{11}{16}$

21.  $\frac{15}{20}$

22.  $\frac{15}{20}$

23.  $\frac{18}{24}$

24.  $\frac{18}{24}$

## Reteaching 114

**R114**

A. Write a mixed number for the picture.

$2\frac{3}{4}$

2 boxes are fully shaded.  
 $\frac{3}{4}$  of one box is shaded.  
 $2\frac{3}{4}$  boxes are shaded.

B. Write a fraction and a mixed number for the lettered point.

$\frac{9}{4}$  or  $2\frac{1}{4}$

To write a mixed number, follow the numerators.  $8 \times 4 = 32$ . Point A is  $\frac{32}{4}$ .

Write a fraction and a mixed number for each picture.

1.  $\frac{3}{4}$

2.  $\frac{3}{4}$

Write a fraction and a mixed number for each lettered point.

3.  $\frac{7}{2}$  or  $3\frac{1}{2}$

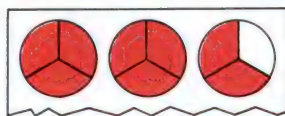
4.  $\frac{8}{3}$  or  $2\frac{2}{3}$

5.  $\frac{23}{5}$  or  $4\frac{3}{5}$



- b. Write a fraction and a mixed number for the model.

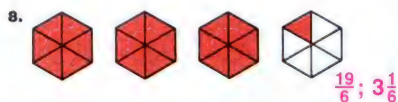
$$\frac{8}{3}; 2\frac{2}{3}$$



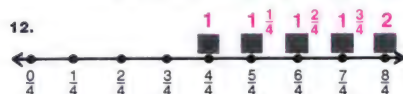
**Practice** Work in groups for all of the exercises. Write each mixed number. Show the mixed numbers in Exercises 1–3 in your punchout fraction models.

1. Three and five tenths  $3\frac{5}{10}$
2. two and five sixths  $2\frac{5}{6}$
3. one and three fifths  $1\frac{3}{5}$
4. four and one fourth  $4\frac{1}{4}$
5. seven and one half  $7\frac{1}{2}$
6. six and five eighths  $6\frac{5}{8}$
7. For Exercises 4–6, sketch figures other than circles to show the mixed numbers. See margin.

Write a fraction and a mixed number for each picture.



Complete the number lines using mixed numbers or whole numbers.



## CALCULATOR

You can use your calculator to show a fraction as a decimal.

Show  $\frac{7}{20}$  as a decimal. Press: 7 ÷ 20 Display: 0.35

Show each fraction as a decimal.

1.  $\frac{3}{4}$  0.75
2.  $\frac{5}{8}$  0.625
3.  $\frac{17}{85}$  0.2
4.  $\frac{41}{50}$  0.82
5.  $\frac{13}{20}$  0.65
6.  $\frac{52}{65}$  0.8
7.  $\frac{60}{96}$  0.625
8.  $\frac{24}{32}$  0.75
9.  $\frac{39}{60}$  0.65

What do you notice about the fractions in

10. 1 and 8? Both equal 0.75
11. 2 and 7? Both equal 0.625
12. 5 and 9? Both equal 0.65

More Practice Set 114, page 392 309

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–13 |
| average  | 1–13 |
| enriched | 1–13 |

More Practice Set 114,  
page 392

## Calculator, page 309

**Reading and Writing Mathematics** Make sure students understand that  $\frac{7}{20}$  and 0.35 are equal; that they are just two different ways of writing the same number. Remind students that they already know many ways to write many numbers and ask for some ways to write the number one. [ $1.0$ ,  $\frac{2}{2}$ ,  $\frac{3}{3}$ ,  $\frac{4}{4}$ ] Have the students read their decimal answers for Exercises 1–9 aloud, and write each decimal as a fraction with a denominator of 10, 100, or 1,000. Encourage students to draw a conclusion from their answers to Exercises 10–12. [If two fractions equal the same decimal, they are equal fractions.]

## Follow-Up Reteaching

**Reading and Writing Mathematics** To give practice in recognizing, writing, and reading mixed numbers, have students make flashcards with a mixed number written in words on one side and in numbers on the other side.

## Computer Assisted Instruction

Mathematics Courseware Series  
• Fractions 1, Activities 4, 5

## Daily Maintenance

Compare these decimals. Use < or >.

1. 3.6  $\bullet$  3.2 [ $>$ ]
2. 0.9  $\bullet$  1.2 [ $<$ ]
3. 0.3  $\bullet$  0.5 [ $<$ ]
4. 16.87  $\bullet$  16.80 [ $>$ ]
5. 29.61  $\bullet$  29.16 [ $>$ ]
6. 34.04  $\bullet$  34.40 [ $<$ ]

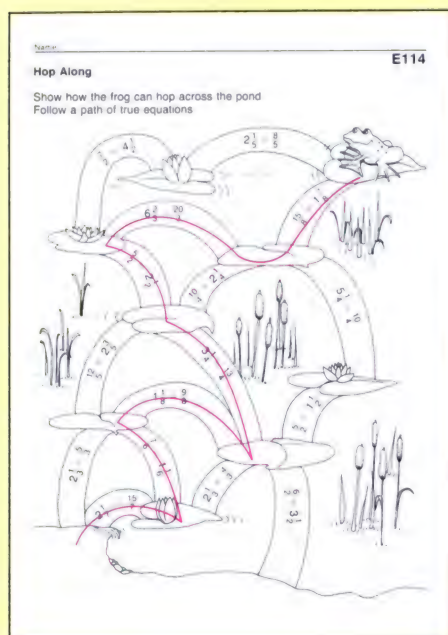
## Answers, page 309

a.  $3\frac{1}{4}$

7. Answers will vary. Samples are given.



## Enrichment 114





## Objective 115

Write fractions or mixed numbers to give lengths of objects to the nearest fourth inch.

### Lesson Theme

Technology: Calculator Components

### Materials

- Inch rulers (Punchouts or Math Kit)

## Introduction

Discuss the idea of fractions in measurement. Ask students to give various examples of heights expressed in mixed numbers. [Examples:  $53\frac{1}{2}$  inches,  $62\frac{1}{4}$  inches] Write several of the examples on the chalkboard. Ask for other examples of measurements that are expressed in mixed numbers. [ $8\frac{1}{2} \times 11$  paper]

## Using the Pages

**Teach** Have students use their own rulers to check the measurements on the page.

**Try** After students do the exercises, discuss what they might do when the end of an object being measured falls between the marks on the ruler.

**Practice Estimation** Have the students give estimates for the lengths of the segments in Exercises 8–11 before measuring the lengths. Tell them that the longest segment is about 6 inches long. Have the students compare the lengths of the segments by completing the following sentences.

- The segment in Exercise 9 is about [half] as long as the segment in Exercise 11, so it must be about [3 inches] long.
- The segment in Exercise 8 is about [half] as long as the segment in Exercise 9, so it must be about [ $1\frac{1}{2}$  inches] long.
- The segment in Exercise 10 is shorter/longer [longer] than the segment in Exercise 9, so it must be about [4 inches] long.

**Error Analysis** Watch for students who place the ruler incorrectly when measuring. Remind these students to align one end of the line segment they are measuring with the 0-mark on the ruler.

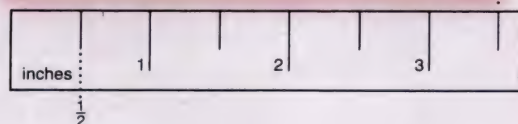
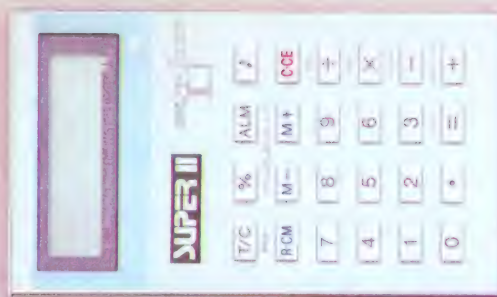
**Apply Problem Solving** Have students indicate the dimension (width) that is to be measured in Problem 12.

**Use physical models** Have objects to measure at measuring stations throughout the room. Cards giving directions for measuring the objects can acquaint the students with such words as height, thickness, width, and depth.

## Fractions in Measurement

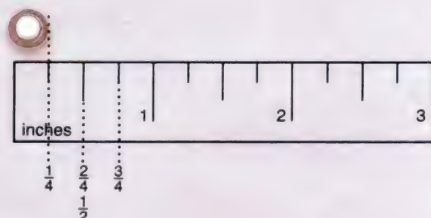
- A. When an inch is separated into two equal parts, you can measure in half inches.

This calculator is  $3\frac{1}{2}$  inches long.



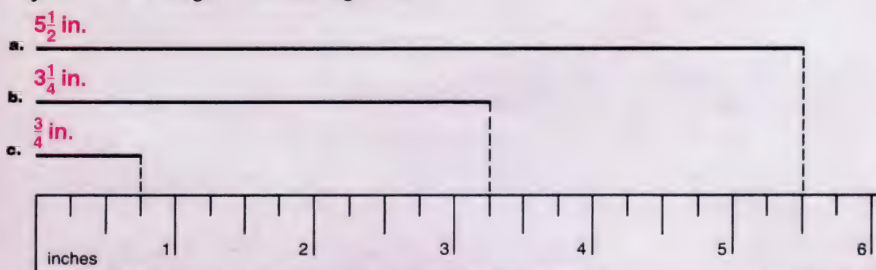
- B. When an inch is separated into four equal parts, you can measure in fourth inches.

The width of this battery is  $\frac{1}{4}$  inch.



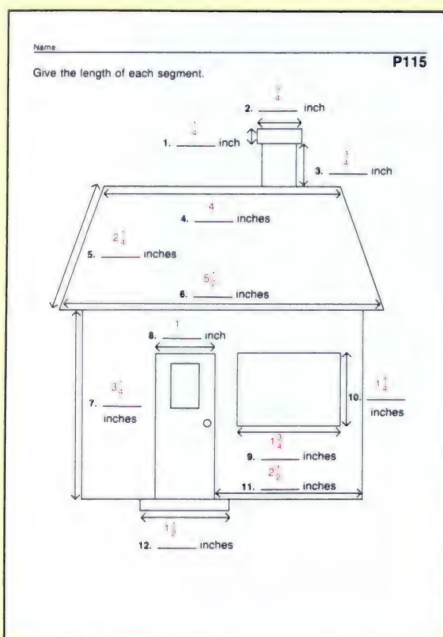
Notice that the same mark on this ruler shows either  $\frac{2}{4}$  inch or  $\frac{1}{2}$  inch.

**Try** Give the length of each segment.

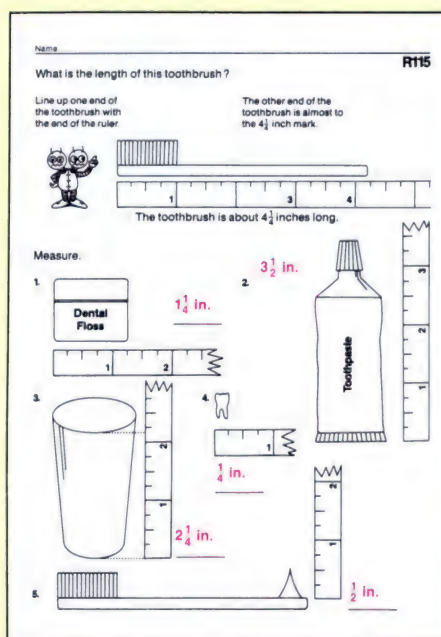


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## Practice 115

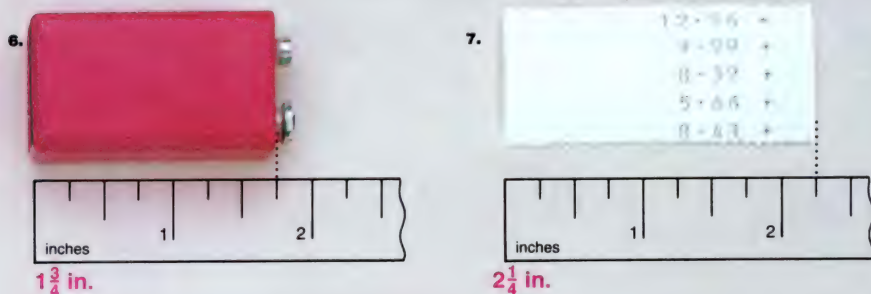
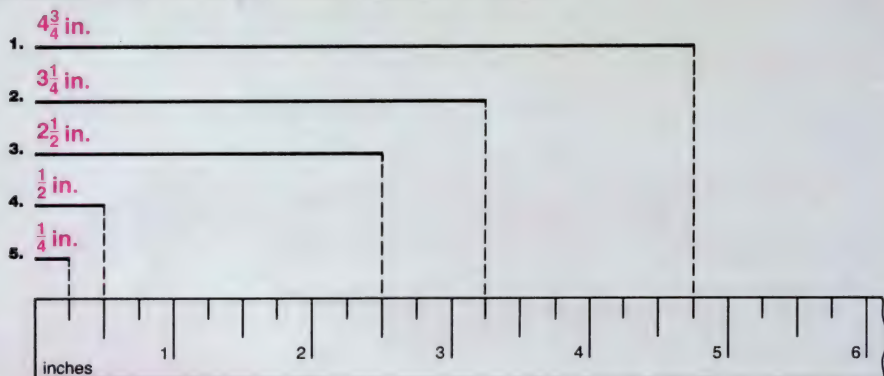


## Reteaching 115





**Practice** Give the length of each segment or object.



Use a ruler to measure each segment.

8.  $1\frac{1}{2}$  in.
9. 3 in.
10.  $4\frac{1}{4}$  in.
11.  $5\frac{3}{4}$  in.

### Apply

12. Use a ruler to measure the width of the battery in Exercise 6. **1 in.**
13. Use a ruler to draw a segment that is  $2\frac{3}{4}$  inches long.
14. **Calculator** Is  $\frac{125}{16}$  inches more or less than 8 inches? Check your answer by changing the fraction to a decimal. **Press:** 125  $\div$  16  $=$  **Less**

More Practice Set 115, page 393 **311**

## Assignment Guide

basic 1-14  
average 1-14  
enriched 1-14

**More Practice Set 115,**  
**page 393**

## Follow-Up

### Extra Practice Using Concrete Materials

Have students draw line segments and estimate the lengths in inches. Then have students check each estimate by measuring to the nearest half inch or the nearest fourth inch.

### Reteaching

Students who have difficulty measuring more than 1 inch should first determine what the whole number part of the measurement is. They should then cover all but the space for the fractional measurement on the ruler. Have students note where the end of the object falls in this space on the ruler to determine the fractional part of the measurement.

### Enrichment

Have students measure items and report those measures as fractions or mixed numbers to the nearest eighth inch.

### Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choices.

1.  $42 \div 6$  [7]
2.  $350 \div 5$  [70]
3.  $630 \div 90$  [7]
4.  $4 \times 6$  [24]
5.  $7 \times 400$  [2,800]
6.  $30 \times 800$  [24,000]
7.  $5,600 \div 60$  [93 R20]

## Reading and Writing Mathematics

Read the following statements to students and have them write whether the statement is *true* or *false*. If the statement is false, have students write the correct statement.

- $\frac{7}{2} > \frac{3}{2}$  [True]  $\frac{5}{7} - \frac{4}{7} = \frac{1}{7}$  [True]  
 $\frac{1}{2}$  of 36 is 13 [False,  $\frac{1}{2}$  of 36 is 18]

### Daily Maintenance

1.  $59 + 88$  [147]
2.  $275 - 46$  [229]
3.  $263 + 627$  [890]
4.  $395 - 174$  [221]
5.  $400 - 26$  [374]
6.  $6,438 + 7,821$  [14,259]
7.  $5,008 - 2,126$  [2,882]

## Enrichment 115

Name \_\_\_\_\_ **E115**

**Seeds and Beans and Things**

The length of this bean is  $\frac{3}{8}$  inch.

Find the length of 2 beans this size.

Make a mark 3 eighths from the beginning.

Count 3 more eighths. This is the length of 2 beans.

The 2 beans have a length of  $\frac{6}{8}$  inch or  $\frac{3}{4}$  inch.

Find each length.

1. 2 seeds this length  $\frac{1}{2}$  inch
2. 3 beans this length  $1\frac{1}{8}$  inch
3. 2 pins this length 1 inch
4. 3 seeds this length  $\frac{9}{16}$  inch
5. 3 beans this length  $\frac{15}{16}$  inch
6. 4 nuts this length 1 inch
7. 3 beans, each  $\frac{5}{16}$  inch long  $\frac{15}{16}$  inch
8. 5 nuts, each  $\frac{3}{16}$  inch long  $\frac{15}{16}$  inch

## Additional Resource 115

Name \_\_\_\_\_ **Additional Resource 115**

**Maintenance**

Add, subtract, multiply, or divide.

|   |   |   |  |   |
|---|---|---|--|---|
| 1. $\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$       | 2. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$  | 3. $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$  | 4. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$ | 5. $\begin{array}{r} 9 \\ + 9 \\ \hline 18 \end{array}$       |
| 6. $\begin{array}{r} 6 \\ - 6 \\ \hline 0 \end{array}$        | 7. $\begin{array}{r} 8 \\ + 7 \\ \hline 15 \end{array}$       | 8. $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$  | 9. $\begin{array}{r} 17 \\ - 8 \\ \hline 9 \end{array}$      | 10. $\begin{array}{r} 13 \\ - 6 \\ \hline 7 \end{array}$      |
| 11. $\begin{array}{r} 2 \\ 5 \overline{)10} \end{array}$      | 12. $\begin{array}{r} 4 \\ 8 \overline{)32} \end{array}$      | 13. $\begin{array}{r} 1 \\ 6 \overline{)6} \end{array}$       | 14. $\begin{array}{r} 7 \\ 9 \overline{)63} \end{array}$     | 15. $\begin{array}{r} 5 \\ 7 \overline{)35} \end{array}$      |
| 16. $\begin{array}{r} 7 \\ + 4 \\ \hline 11 \end{array}$      | 17. $\begin{array}{r} 7 \\ - 0 \\ \hline 7 \end{array}$       | 18. $\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$ | 19. $\begin{array}{r} 7 \\ + 6 \\ \hline 13 \end{array}$     | 20. $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$ |
| 21. $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$ | 22. $\begin{array}{r} 6 \\ + 9 \\ \hline 15 \end{array}$      | 23. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$ | 24. $\begin{array}{r} 8 \\ - 8 \\ \hline 0 \end{array}$      | 25. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$ |
| 26. $\begin{array}{r} 6 \\ 4 \overline{)24} \end{array}$      | 27. $\begin{array}{r} 0 \\ 7 \overline{)0} \end{array}$       | 28. $\begin{array}{r} 9 \\ 6 \overline{)54} \end{array}$      | 29. $\begin{array}{r} 8 \\ 3 \overline{)24} \end{array}$     | 30. $\begin{array}{r} 3 \\ 7 \overline{)21} \end{array}$      |
| 31. $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$ | 32. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ | 33. $\begin{array}{r} 9 \\ + 8 \\ \hline 17 \end{array}$      | 34. $\begin{array}{r} 17 \\ - 9 \\ \hline 8 \end{array}$     | 35. $\begin{array}{r} 13 \\ - 7 \\ \hline 6 \end{array}$      |



## Objective 116

Find the number of objects in a fractional part of a set.

### Lesson Theme

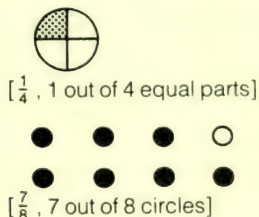
Recreation: Games

### Materials

- Counters (Punchouts)

## Introduction

**Warm-Up Review** Review part of a whole and part of a set. Ask students to give a fraction for the shaded part or parts of each picture.



## Using the Pages

**Teach** Read and discuss the example step-by-step. Remind the students that the denominator of the fraction tells how many equal groups the objects need to be separated into. Stress that the groups are equal so that each one must contain the same number of objects. Use objects to illustrate the example and put the 20 objects one at a time into 4 equal groups. One of these groups (containing 5 objects) is 1 out of 4, or  $1/4$  of all the groups. Therefore,  $1/4$  of 20 is 5.

Emphasize that dividing is faster than drawing a picture.

**Try** Let students draw a picture for Exercise b if they are having difficulty doing the exercise.

**Practice Error Analysis** Watch for students who multiply by the denominator instead of dividing. Ask these students if a fractional part of a number is more or less than that number. [Less] Explain that multiplying by the denominator is not sensible because the answer would be larger than the original number. Have these students write division sentences as shown in Example b for each of the exercises.

**Apply Problem Solving** Students may wish to use counters to help solve these problems.

**Give sensible answers** Have students check the reasonableness of their answers. All the fractional parts in this lesson are less than or equal to  $1/2$  so all answers should be less than or equal to half the number given in the exercise.

## Finding Fractional Parts

Dawn and Nancy Redbird played a game. Each player had 20 game marbles. Dawn lost  $1/4$  of her game marbles to Nancy. How many game marbles did she lose to Nancy?

Find  $1/4$  of 20.

You can put the 20 marbles into 4 equal groups.



Each group is  $1/4$  of 20.

There are 5 marbles in each group.

$1/4$  of 20 is 5.

You can also divide 20 by 4 to find  $1/4$  of 20.

$$20 \div 4 = 5$$

Dawn lost 5 game marbles to Nancy.

**Try** Find each answer.

a.  $1/3$  of 9



$$9 \div 3 = \boxed{3}$$

b.  $1/5$  of 20

$$20 \div 5 = \boxed{4}$$

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## Practice 116

Name \_\_\_\_\_ P116

Find each answer.

- $1/3$  of 30 = 10
- $1/4$  of 35 = 7
- $1/2$  of 8 = 4
- $1/6$  of 18 = 3
- $1/3$  of 36 = 12
- $1/4$  of 44 = 11
- $1/6$  of 32 = 4
- $1/4$  of 48 = 12
- $1/2$  of 16 = 8
- $1/3$  of 75 = 25
- $1/4$  of 81 = 20.25
- $1/2$  of 200 = 100
- $1/10$  of 40 = 4
- $1/7$  of 7 = 1
- $1/6$  of 96 = 16

Solve each problem.

- Brad had 45 marbles. He gave  $1/5$  of them to Marlene. How many marbles did he give to Marlene?  
 9 marbles
- There are 20 children in the class.  $1/4$  of them ride the bus. How many children ride the bus?  
 5 children
- Mario had 88 Sunday newspapers to deliver. He asked Bill to deliver  $1/8$  of them. How many papers did Mario ask Bill to deliver?  
 11 papers
- The school store has 110 pens.  $1/5$  of them are marking pens. How many marking pens does the store have?  
 22 pens

## Reteaching 116

Name \_\_\_\_\_ R116

Find  $1/5$  of 15.

Put the boats in 5 equal groups. Each group is  $1/5$  of 15.

An easier way to find  $1/5$  of 15 is to divide 15 by 5.

What is always falling down but never gets hurt?

Find each answer. Match each letter to its answer in the blanks below. Two answers are not used.

- $1/6$  of 6 = 1
- $1/3$  of 27 = 9
- $1/5$  of 35 = 7
- $1/4$  of 34 = 8.5
- $1/3$  of 28 = 9.33
- $1/6$  of 72 = 12
- $1/8$  of 48 = 6
- $1/3$  of 48 = 16
- $1/5$  of 50 = 10
- $1/2$  of 14 = 7
- $1/3$  of 36 = 12
- $1/5$  of 50 = 10

A   W   A   T   E   R   F   A   L   L  
8   10   17   16   12   3   5   2   25   1



## MAINTENANCE

**Practice** Find each answer.

1.  $\frac{1}{2}$  of 8  
**4**
2.  $\frac{1}{3}$  of 6  
**2**
3.  $\frac{1}{4}$  of 4  
**1**
4.  $\frac{1}{5}$  of 10  
**2**
5.  $\frac{1}{2}$  of 16  
**8**
6.  $\frac{1}{3}$  of 33  
**11**
7.  $\frac{1}{4}$  of 28  
**7**
8.  $\frac{1}{5}$  of 25  
**5**
9.  $\frac{1}{6}$  of 42  
**7**
10.  $\frac{1}{8}$  of 72  
**9**
11.  $\frac{1}{2}$  of 38  
**19**
12.  $\frac{1}{4}$  of 56  
**14**
13.  $\frac{1}{5}$  of 60  
**12**
14.  $\frac{1}{3}$  of 93  
**31**

**Apply** Solve each problem.

15. Mr. Garcia bought 24 poster boards. He used  $\frac{1}{2}$  of them to make games. How many poster boards did he use to make games?  
**12 poster boards**
16. A game board had 50 squares.  $\frac{1}{10}$  of them were blue. How many squares were blue?  
**5 squares**

Add or subtract.

1.  $46 + 84$   
**130**
2.  $52 + 79$   
**131**
3.  $74 - 57$   
**17**
4.  $63 - 36$   
**27**
5.  $356 + 473$   
**829**
6.  $265 + 383$   
**648**
7.  $456 - 228$   
**228**
8.  $368 - 175$   
**193**
9.  $1.58 + 2.83$   
**4.41**
10.  $3.74 + 1.48$   
**5.22**
11.  $2.83 - 1.58$   
**1.25**
12.  $7.61 - 3.05$   
**4.56**
13.  $21.4 + 68.6$   
**90.0**
14.  $43.7 + 36.3$   
**80.0**
15.  $68.6 - 57.8$   
**10.8**
16.  $35.1 - 19.2$   
**15.9**
17.  $33.78 + 26.81$   
**60.59**
18.  $50.26 + 18.97$   
**69.23**
19.  $53.21 - 24.06$   
**29.15**
20.  $75.39 - 4.57$   
**70.82**

## Assignment Guide

|          |      |
|----------|------|
| basic    | 1-16 |
| average  | 1-16 |
| enriched | 1-16 |

**More Practice Set 116, page 393**

**Homework to do with others** Pose this problem to students: Craig and Scott played three games of marbles. Craig began with 20 marbles and lost  $\frac{1}{4}$  of his marbles in the first game,  $\frac{1}{3}$  of his remaining marbles in the second, and  $\frac{1}{2}$  of those in the third. How many marbles did Craig have left? [5] Have each student discuss strategies and solutions with an adult and report to class.

## Follow-Up

**Extra Practice** Have students do the following exercises and problems.

1.  $\frac{1}{7}$  of 42 [6]
2.  $\frac{1}{5}$  of 40 [8]
3.  $\frac{1}{8}$  of 56 [7]
4.  $\frac{1}{9}$  of 90 [10]
5.  $\frac{1}{6}$  of 66 [11]
6.  $\frac{1}{2}$  of 48 [24]

7. A club had 54 members. If  $\frac{1}{6}$  of them came to the club meeting, how many members were there? [9]
8. Sam had 48 pipe cleaners. He used  $\frac{1}{4}$  of them to make a figure. How many did he use? [12]

## Reteaching Using Concrete Materials

Have students display 12 white counters. Tell students you want  $\frac{1}{4}$  of the counters to be red. (Counters from the Punchouts are red on one side and white on the other.) Have the students separate the counters, one by one, into 4 groups. Tell them to turn over all the counters in one group and count them. Have students use this activity to do Exercises 3-14.

## Enrichment 116

Name \_\_\_\_\_ E116

**Picturing Distances**

Use a ruler and the fraction strips below to complete each exercise.

After 4 minutes, runners in a race had gone the following distances. Show how far each runner had gone.

1. Tim:  $\frac{1}{8}$  mile
2. Sue:  $\frac{1}{4}$  mile
3. John:  $\frac{5}{8}$  mile
4. Karen:  $\frac{7}{8}$  mile
5. Bill:  $\frac{3}{4}$  mile
6. Lynn:  $\frac{1}{2}$  mile

Later in the race, Tim is  $\frac{1}{4}$  mile behind Sue, John is  $\frac{1}{4}$  mile behind Karen, Lynn is  $\frac{5}{8}$  mile ahead of Sue, Sue is  $\frac{1}{4}$  mile ahead of John, and Bill is  $\frac{1}{2}$  mile ahead of Tim. Show the positions of the runners.

At this point in the race, who is

7. first? **Lynn**
8. second? **Bill**
9. third? **Karen**

## Additional Resource 116

Name \_\_\_\_\_ Additional Resource 116

**Computer BASIC: Writing INPUT Programs**

Write a program that asks for a fraction by asking first for the numerator and then for the denominator. It should use the input fractions from each exercise and print that fractional part of 24. Write your answers.

Programs will vary. Sample program is given.

```

10 PRINT "ENTER A NUMERATOR:"
20 INPUT N
30 PRINT "ENTER A DENOMINATOR:"
40 INPUT D
50 PRINT "THE ANSWER IS:"
60 PRINT N/D/24
70 END

```

Remember to type NEW before entering your next program.

3. Write a program that asks for three numbers and prints their product. Show your program and its output.

Programs will vary. Sample program is given.

```

10 REM MULTIPLYING INPUT
20 PRINT "ENTER 3 NUMBERS:"
30 INPUT A,B,C
40 PRINT "THE PRODUCT IS:"
50 PRINT A*B*C
60 END

```

Output:

ENTER 3 NUMBERS  
2 3 4  
THE PRODUCT IS: 24

**Enrichment** Have students find fractional parts of a dollar by answering these questions.

- Which coin is
1.  $\frac{1}{2}$  of a dollar [Half-dollar]
  2.  $\frac{1}{4}$  of a dollar [Quarter]
  3.  $\frac{1}{10}$  of a dollar [Dime]
  4.  $\frac{1}{20}$  of a dollar [Nickel]

## Daily Maintenance

**Mental Math** Have students do these exercises mentally.

1.  $56 \div 7$  [8]
2.  $81 \div 9$  [9]
3.  $36 \div 6$  [6]
4.  $63 \div 9$  [7]
5.  $72 \div 8$  [9]
6.  $48 \div 8$  [6]



## Objective 117

Solve problems by drawing pictures to find fractional parts.

### Lesson Theme

School Activities: Classes

### Materials

- Counters

## Introduction

**Warm-Up Review** Review the previous lesson by putting 15 objects on the overhead projector. Tell students we want to find  $\frac{1}{3}$  of 15. Separate the objects one at a time into 3 equal groups. One group contains 5 objects; therefore,  $\frac{1}{3}$  of 15 is 5.

## Using the Pages

**Teach** Have students read the example. Then extend the introduction to show that we need to count the objects or counters in two groups to find  $\frac{2}{3}$  of 15. Two groups contain 10 objects or counters, so  $\frac{2}{3}$  of 15 is 10.

**Try** Stress that students cannot simply divide by the denominator to find the answer, because we are now looking for the number of objects in more than one group. Some students may understand that they can divide by the denominator to find how many objects are in each group and then multiply that number by the numerator to find the answer.

**Apply Problem Solving** Encourage creative thinking rather than rapid responses.

**Use logical reasoning** Problems 6–8 could be solved by finding one fractional part of the total amount and subtracting that amount from the total amount. For example, in Problem 6 have students find  $\frac{1}{5}$  of 20 [4] and subtract 4 from 20 to find the answer. [16]

In Problem 9 students can draw a picture to find  $\frac{3}{8}$  of 32, but they must then subtract the answer from 32. An alternate method is simply to find  $\frac{5}{8}$  of 32.

**Write a problem** Have students write a problem using  $\frac{2}{3}$  and 27. Then have them solve it.

**Calculator** In Problem 10 explain that the students are dividing 20 by 4 and then multiplying by 3 whether they use paper and pencil or a calculator. Therefore, the answer is the same.

## Problem Solving Use a Picture

### Read

There are 15 students in Mr. Reed's class. If  $\frac{2}{3}$  of them ride the school bus each day, how many of the students ride the school bus each day?

### Plan

In  $\frac{2}{3}$ , the 3 means 3 equal groups, and the 2 means 2 of the groups. To draw a picture showing the 15 students separated into 3 equal groups, place an x in each group until you have made 15 xs. Then count the number of xs in 2 groups.

| Solve | Group 1 | Group 2 | Group 3 |
|-------|---------|---------|---------|
|       | X       | X       | X       |
|       | X       | X       | X       |
|       | X       | X       | X       |
|       | X       | X       | X       |
|       | X       | X       | X       |

There are 10 xs in 2 groups.

### Answer

There are 10 students from Mr. Reed's class who ride the school bus each day.

### Look Back

$\frac{2}{3}$  of the students would be twice as many as  $\frac{1}{3}$ .

$$\frac{1}{3} \text{ of } 15 = 5 \quad 15 \div 3 = 5$$

$$2 \times 5 = 10$$

The answer is reasonable.



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## Practice 117

Name \_\_\_\_\_ P117

Solve each problem. Draw a picture to help you.

- Flag School had a health fair. The school has 20 classrooms.  $\frac{3}{4}$  of the classrooms entered projects. How many classrooms entered projects?  
  
16 classrooms
- $\frac{1}{3}$  of the 27 student clubs helped plan the fair. How many clubs helped plan the fair?  
  
9 clubs
- Room A made a snack food with 12 ingredients.  $\frac{1}{4}$  of the ingredients were vegetables. How many ingredients were vegetables?  
  
11 ingredients
- In the gym, 60 students tested their muscle strength.  $\frac{2}{5}$  of them could do more than fifty sit-ups. How many could do more than fifty sit-ups?  
  
40 students
- Room R has 32 students.  $\frac{3}{8}$  of the students made a poster about exercising. How many students made the poster?  
  
24 students
- 20 teachers went to the health fair.  $\frac{1}{5}$  of them had their blood pressure taken. How many teachers had their blood pressure taken?  
  
14 teachers

## Reteaching 117

Name \_\_\_\_\_ R117

There are 12 birds in the city zoo.  $\frac{2}{3}$  of the birds are adults. How many birds are adults?

Draw a picture to help you.

12 birds in all → Draw 12 marks.

$\frac{2}{3}$  Number of equal groups to draw.

2 Number of groups to circle.

Count the number of circled marks.

8 of the birds are adults.

Solve each problem. Draw a picture to help you.

- $\frac{1}{4}$  of the birds are cardinals. How many are cardinals?  
  
4 birds
- $\frac{2}{3}$  of the birds have feathers. How many have feathers?  
  
12 birds
- $\frac{1}{3}$  of the birds have yellow beaks. How many have yellow beaks?  
  
6 birds
- $\frac{1}{4}$  of the birds have long tails. How many have long tails?  
  
3 birds
- $\frac{1}{2}$  of the birds have crowns. How many have crowns?  
  
7 birds
- $\frac{2}{3}$  of the birds live in trees. How many live in trees?  
  
10 birds





- Try** Solve each problem. Draw a picture to help you.
- A reading class has 20 students. If  $\frac{7}{10}$  of the class went to the library, how many students went to the library?  
**14 students**
  - If  $\frac{3}{4}$  of the 28 members of Shelley's swimming team are girls, how many members are girls?  
**21 members**
- Apply** Solve each problem. Draw a picture to help you.
- The art class has 36 projects for the art fair. If  $\frac{5}{6}$  of the projects are drawings, how many drawings are there?  
**30 drawings**
  - Mitch's science class had 15 chicken eggs. If  $\frac{3}{5}$  of the eggs hatched, how many eggs hatched?  
**9 eggs**
  - If  $\frac{5}{8}$  of the 40 students in gym class have new shoes, how many students have new shoes?  
**25 students**
  - Ken has finished working  $\frac{2}{5}$  of 25 math problems. How many problems has he finished?  
**10 problems**
  - Miss Rako's class has 30 students. If  $\frac{3}{10}$  of the students are absent, how many students are absent?  
**9 students**
  - The Wilson School football team won  $\frac{4}{5}$  of its 20 games. How many games did they win?  
**16 games**
  - Maria used  $\frac{7}{8}$  of her 8 crayons to color a picture. How many crayons did she use?  
**7 crayons**
  - After class,  $\frac{9}{10}$  of the 50 students had boarded the bus. How many students had boarded the bus?  
**45 students**
  - If  $\frac{3}{8}$  of the 32 desks in Mr. Clark's room are new, how many desks are old?  
**20 desks**
  - Calculator** Find  $\frac{3}{4}$  of 20 with paper and pencil. Then use a calculator. Press:  $20 \div 4 \times 3 =$ . Is the answer the same using either method?  
**Yes**

More Practice Set 117, page 393 **315**

## Assignment Guide

basic 1-7, 10  
average 1-8, 10  
enriched 1-10

**More Practice Set 117,**  
**page 393**

## Follow-Up

**Extra Practice** Change the fractions in Problems 1-8 as follows, and have students do the new problems.

- $\frac{5}{9}$  [20]
- $\frac{2}{5}$  [6]
- $\frac{3}{8}$  [15]
- $\frac{4}{5}$  [20]
- $\frac{2}{3}$  [20]
- $\frac{3}{4}$  [15]
- $\frac{5}{8}$  [5]
- $\frac{4}{5}$  [40]

## Reteaching Using Concrete Materials

Have students display 20 white counters. Tell them you want  $\frac{3}{5}$  of the counters to be red. (Counters from the Punchouts are red on one side and white on the other.) Have students separate the counters, one by one, into 5 groups. Tell them to turn over all the counters in 3 groups and count them. Write this on the board:  $\frac{3}{5}$  of 20 is 12. Have students use this activity to do Exercises 1-9.

**Enrichment** Have the students make up problems similar to those on this page, exchange them with other students, and solve them.

## Calculator

Have students use calculators to write these fractions as decimals, and compare them.

- $\frac{1}{8}$   $\frac{2}{15}$  [ $<$ ]
- $\frac{3}{4}$   $\frac{2}{3}$  [ $>$ ]
- $\frac{5}{16}$   $\frac{2}{7}$  [ $>$ ]
- $\frac{8}{19}$   $\frac{3}{8}$  [ $>$ ]
- $\frac{3}{8}$   $\frac{3}{9}$  [ $>$ ]

## Cooperative Learning Groups

See page 484 of this Teacher's Edition.

## Daily Maintenance

- $96 \div 16$  [6]
- $56 \div 28$  [2]
- $91 \div 13$  [7]
- $39 \div 11$  [3 R6]
- $386 \div 21$  [18 R8]
- $492 \div 34$  [14 R16]

## Enrichment 117

Name \_\_\_\_\_ E117

**Cashing in On Fractions**

Use a picture to solve each problem. Write the answer with a \$ and a decimal point.

- There are 5 coins.  $\frac{2}{5}$  are nickels. The rest are dimes. How much money is this altogether?  
**\$0.40**
- There are 6 coins.  $\frac{2}{3}$  are quarters,  $\frac{1}{6}$  is a penny, and the rest are nickels. How much money is this altogether?  
**\$0.66**
- There are 8 coins.  $\frac{3}{8}$  are nickels. The rest are quarters. How much money is this altogether?  
**\$1.00**
- There are 7 coins.  $\frac{2}{7}$  are half dollars,  $\frac{1}{7}$  are nickels, and the rest are quarters. How much money is this altogether?  
**\$1.65**
- There are 10 coins.  $\frac{1}{10}$  are dimes. The rest are pennies. How much money is this altogether?  
**\$0.46**
- There are 12 coins.  $\frac{5}{12}$  are dimes,  $\frac{1}{12}$  is a quarter, and the rest are pennies. How much money is this altogether?  
**\$0.81**
- There are 8 coins.  $\frac{1}{8}$  is a half dollar,  $\frac{3}{8}$  are nickels, and the rest are quarters. How much money is this altogether?  
**\$1.65**
- There are 9 coins.  $\frac{2}{9}$  are pennies. The rest are quarters. How much money is this altogether?  
**\$1.29**

## Additional Resource 117

Name \_\_\_\_\_ Additional Resource 117

**Project Taking Measure**

Materials needed: yardstick, string

- Use a yardstick to measure the width of a door. How wide is the door to the nearest  $\frac{1}{4}$  inch?  
**Answers will vary.**
- Use a piece of string to measure a globe. Wrap the string around the globe. Hold the string with two fingers at the exact spot where the string meets. Then measure this length of the string. What does the globe measure to the nearest  $\frac{1}{4}$  inch?  
**Answers will vary.**

Measure each of the following to the nearest  $\frac{1}{4}$  inch.

- The length of your desk top **Answers will vary.**
- The width of your desk top **Answers will vary.**
- The length of a textbook **Answers will vary.**
- The width of a textbook **Answers will vary.**





## Objective 118

Add fractions with the same denominator.

### Lesson Theme

Art: Art Fair

### Materials

- Fraction Models (Punchouts)

## Introduction

**Warm-Up Review** Have students compare each fraction with 1, using  $<$ ,  $>$ , or  $=$ .

- $3/5 \bullet 1$  [ $<$ ]
- $7/4 \bullet 1$  [ $>$ ]
- $6/10 \bullet 1$  [ $<$ ]
- $9/9 \bullet 1$  [ $=$ ]

## Using the Pages

### Teach Using Concrete Materials

Discuss the examples after students have tried them on their own. For Example A, make sure students understand that when they count the fifths, they are finding the sum of the fractions  $1/5$  and  $3/5$ . Have students write a number sentence showing this. [ $1/5 + 3/5 = 4/5$ ] Point out to students that the denominators are the same in both addends and the sum. In Example B, students place 7 eighths in a circle. Then they try to place 3 more eighths in the frame. Students will notice that one circle is filled and 2 eighths are left over. Have students count the number of eighths in all. Then write " $7/8 + 3/8 = 10/8$ , or  $1-2/8$ " on the chalkboard.

**Try Using Concrete Materials** Ask students which of the exercises results in an answer of less than one [a], greater than one [b], and equal to one [c]. Make sure students understand that  $10/10$  can be rewritten as 1.

**Practice Error Analysis** Watch for students who, once they have filled a fraction frame, stack any additional fraction models on pieces that have already been laid down. Remind them that it is possible to model fractions greater than one and rewrite them as mixed numbers as they did in Example B.

After students complete several of the exercises, most of them will have discovered the algorithm for adding fractions with the same denominator. You may wish to allow them to use it at this time. Ask the class to state the algorithm in their own words and write it on the board. The algorithm is given in Example A on page 320, where students will also see the algorithm for adding two fractions with different denominators (Example B.) (Continued on page 317.)

## Addition: Same Denominator

For this lesson you need to work with another student. Both of you will use your punchout fraction models.

- A.** At the community art fair, Charles Wilson used  $\frac{1}{5}$  of his booth to display puppets and  $\frac{3}{5}$  of his booth for wood carvings. What fraction of the booth was used for displaying puppets or wood carvings?

Find  $\frac{1}{5} + \frac{3}{5}$ .

Use your punchout models to add.



Place one of the fifths in a circle.  
Place three more of the fifths in the same circle.  
How many fifths are in the circle? **4 fifths**

What fraction of the booth was used for displaying puppets or wood carvings?  **$\frac{4}{5}$  of the booth**

- B.** Find  $\frac{7}{8} + \frac{3}{8}$ .  **$\frac{10}{8}$  or  $1\frac{2}{8}$**



Discuss how to find the sum. Use your models to find the sum. Is it less than 1, greater than 1, or equal to 1? How do you know?

**Greater than one. More than one circle is filled.**

**Try** Use your punchout fraction models to add.

**a.**  $\frac{1}{3} + \frac{1}{3}$

**b.**  $\frac{3}{4} + \frac{2}{4}$   
 **$\frac{5}{4}$  or  $1\frac{1}{4}$**

**c.**  $\frac{7}{10} + \frac{3}{10}$   
 **$\frac{10}{10}$  or 1**

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Use Practice 118, Reteaching 118, Enrichment 118, and Additional Resource 118 after pages 320–321. See note at the top of page 317.

## Practice 118

**Practice 118**

How do you make an elephant float?

To answer the riddle, work each exercise. Each time an answer is given in the code, write the letter for that exercise. Some answers are used twice.

1.  $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$  T

2.  $\frac{3}{10} + \frac{7}{10} = \frac{10}{10}$  N

3.  $\frac{4}{5} + \frac{1}{5} = \frac{5}{5}$  S

4.  $\frac{6}{8} + \frac{2}{8} = \frac{8}{8}$  O

5.  $\frac{5}{6} + \frac{1}{6} = \frac{6}{6}$  O

6.  $\frac{8}{9} + \frac{1}{9} = \frac{9}{9}$  O

7.  $\frac{5}{4} + \frac{1}{4} = \frac{6}{4}$  C

8.  $\frac{6}{7} + \frac{1}{7} = \frac{7}{7}$  E

9.  $\frac{5}{12} + \frac{4}{12} = \frac{9}{12}$  O

10.  $\frac{6}{9} + \frac{3}{9} = \frac{9}{9}$  P

11.  $\frac{7}{9} + \frac{2}{9} = \frac{9}{9}$  M

12.  $\frac{3}{10} + \frac{6}{10} = \frac{9}{10}$  B

13.  $\frac{4}{8} + \frac{4}{8} = \frac{8}{8}$  O

14.  $\frac{4}{12} + \frac{8}{12} = \frac{12}{12}$  R

15.  $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$  E

16.  $\frac{11}{7} + \frac{4}{7} = \frac{15}{7}$  F

17.  $\frac{6}{8} + \frac{1}{8} = \frac{7}{8}$  O

**ONE ESCOOP OF**

elephant and

**SOME ROO T BEER**

## Reteaching 118

**Reteaching 118**

Find  $\frac{1}{4} + \frac{2}{4}$ .

You can use a picture.

Or you can add  $\frac{1}{4}$  and  $\frac{2}{4}$  like this.

The denominators are the same. Add the numerators.

What do you call two pears?

Add. Then match the letters with the answers below.

1.  $\frac{2}{3} + \frac{1}{3} = \frac{3}{3}$  A

2.  $\frac{1}{5} + \frac{4}{5} = \frac{5}{5}$  A

3.  $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$  R

4.  $\frac{4}{6} + \frac{2}{6} = \frac{6}{6}$  F

5.  $\frac{2}{8} + \frac{6}{8} = \frac{8}{8}$  B

6.  $\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$  P

7.  $\frac{1}{3} + \frac{2}{3} = \frac{3}{3}$  R

8.  $\frac{5}{12} + \frac{7}{12} = \frac{12}{12}$  I

9.  $\frac{3}{16} + \frac{13}{16} = \frac{16}{16}$  O

10.  $\frac{7}{9} + \frac{2}{9} = \frac{9}{9}$  E

11.  $\frac{12}{15} + \frac{3}{15} = \frac{15}{15}$  A

12.  $\frac{5}{10} + \frac{5}{10} = \frac{10}{10}$  P

**PAIR OF PEARS**



Also accept answers written as mixed numbers.

**Practice** Use your punchout fraction models to add.

1.  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
2.  $\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$
3.  $\frac{3}{6} + \frac{3}{6} = \frac{6}{6}$
4.  $\frac{1}{7} + \frac{5}{7} = \frac{6}{7}$
5.  $\frac{0}{2} + \frac{1}{2} = \frac{1}{2}$
6.  $\frac{4}{6} + \frac{2}{6} = \frac{6}{6}$
7.  $\frac{4}{9} + \frac{5}{9} = \frac{9}{9}$
8.  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5}$
9.  $\frac{4}{2} + \frac{2}{2} = \frac{6}{2}$
10.  $\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$
11.  $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$
12.  $\frac{3}{6} + \frac{5}{6} = \frac{8}{6}$
13.  $\frac{2}{3} + \frac{0}{3} = \frac{2}{3}$
14.  $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$
15.  $\frac{5}{4} + \frac{4}{4} = \frac{9}{4}$
16.  $\frac{1}{3} + \frac{2}{3} = \frac{3}{3}$
17.  $\frac{3}{10} + \frac{4}{10} = \frac{7}{10}$
18.  $\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$
19.  $\frac{6}{10} + \frac{7}{10} = \frac{13}{10}$
20.  $\frac{4}{12} + \frac{7}{12} = \frac{11}{12}$
21.  $\frac{5}{8} + \frac{9}{8} = \frac{14}{8}$

**Apply** Solve each problem.

22. At a county fair,  $\frac{1}{10}$  of the art was jewelry and  $\frac{2}{10}$  was woodcraft. What fraction of the art was jewelry or woodcraft?  
 **$\frac{3}{10}$  of the art**
23. One eighth of the 40 artists at the fair received prize ribbons. How many of the artists received ribbons?  
**5 artists**
24. At the art guild fair,  $\frac{4}{6}$  of the art is paintings done with oils or water colors and  $\frac{2}{6}$  of the art is sketches done with pastels, charcoal, pen or pencil. What fraction of the fair is paintings or sketches?  
 **$\frac{6}{6}$  or the whole fair**
25. **Find the facts.** What fraction of the students in your class are boys? What fraction are girls? What is the sum of these two fractions?

**Answers will vary. The sum of the two fractions will be one.**

More Practice Set 118, page 394

## COMPUTER

### BASIC: INPUT Statements

Some fractions can be written as whole numbers. The program below changes these fractions to whole numbers.

INPUT statements are used to enter the numerator (N) and the denominator (D).

```
10 PRINT "ENTER NUMERATOR"
20 INPUT N
30 PRINT "ENTER DENOMINATOR"
40 INPUT D
50 PRINT N/D
60 END
```

When the fraction is  $\frac{6}{2}$ , 6 is typed for N, 2 is typed for D, and this is printed.

```
ENTER NUMERATOR
?6
ENTER DENOMINATOR
?2
3
```

What number should be typed for N for each of the following?

1.  $\frac{4}{2} = 4$
2.  $\frac{9}{3} = 9$
3.  $\frac{10}{2} = 10$

What number should be typed for D for each of the following?

4.  $\frac{8}{4} = 4$
5.  $\frac{12}{3} = 3$
6.  $\frac{15}{3} = 3$

For the program above, tell what would be printed using the fraction given in **See margin**.

7. Exercise 1.
8. Exercise 2.
9. Exercise 3.
10. Exercise 4.
11. Exercise 5.
12. Exercise 6.

## Assignment Guide

basic 1–25  
average 1–25  
enriched 1–25

Note: Pages 316–317 and 320–321 contain a 2-lesson sequence that moves from concrete to symbolic. First, use the student pages for both lessons. Then go back and assign ancillary pages and More Practice sets for the lessons.

**More Practice Set 118, page 394**

(Continued from page 316.)

**Apply Problem Solving** Problems 22 and 24 involve adding fractions. Problem 23 involves finding the fractional part of a number.

Ask students to name the denominator of the fractions used in Problem 25. [The total number of students in class]

### Computer

Tell students that the computer is dividing the numerator by the denominator to change these fractions to whole numbers.

Ask students what line could be added to print the sentence "THE WHOLE NUMBER IS" before the answer in each case. [45 PRINT "THE WHOLE NUMBER IS"]

### Follow-Up

**Reteaching** Have students make up fraction kits to use for concrete examples when adding (and later, subtracting) fractions. The kit should contain several whole 8-inch circles and several 8-inch circles cut into fractional parts—halves, thirds, fourths, and so on. Each kind of fractional part should be of a different color.

### Computer Assisted Instruction

Mathematics Courseware Series

• Fractions 2, Activity 1

### Daily Maintenance

Compare the fractions. Use < or >.

1.  $\frac{1}{4} < \frac{3}{4}$  [ $<$ ]
2.  $\frac{5}{7} > \frac{2}{7}$  [ $>$ ]
3.  $\frac{6}{8} < \frac{7}{8}$  [ $<$ ]
4.  $\frac{1}{3} > \frac{0}{3}$  [ $>$ ]
5.  $\frac{6}{7} > \frac{3}{7}$  [ $>$ ]
6.  $\frac{2}{5} < \frac{4}{5}$  [ $<$ ]

**Answers page 317**

See page 350 of this Teacher's Edition.







## Enrichment 118

Name \_\_\_\_\_

**Wheels**

For each exercise, find two fractions with the same denominator as the one given. Add the fractions and write the numerator in the box. Then find the picture with the same number of equal parts. Shade in the number of parts equal to the numerator. Write the fraction that is shaded.

**Answers may vary.**

1.  $\frac{1}{9}$  
2.  $\frac{1}{7} + \frac{2}{7} = \frac{3}{7}$  
3.  $\frac{1}{4} + \frac{3}{4} = \frac{4}{4}$  
4.  $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$  
5.  $\frac{1}{3} + \frac{2}{3} = \frac{3}{3}$  
6.  $\frac{1}{6} + \frac{5}{6} = \frac{6}{6}$  
7.  $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$  
8.  $\frac{1}{12} + \frac{4}{12} = \frac{5}{12}$  

## Additional Resource 118

Name \_\_\_\_\_

**Mental Math Figuring Fractions**

This number line is marked off in fourths. Use it to find these sums.

1.  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
2.  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
3.  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
4.  $1\frac{1}{4} + \frac{1}{4} = 1\frac{2}{4}$
5.  $1\frac{1}{4} + \frac{1}{4} = 1\frac{2}{4}$
6.  $2\frac{1}{4} + \frac{1}{4} = 2\frac{2}{4}$
7.  $2\frac{1}{4} + \frac{1}{4} = 2\frac{2}{4}$
8.  $1\frac{1}{4} + \frac{1}{4} = 1\frac{2}{4}$
9.  $1 + \frac{1}{4} = 1\frac{1}{4}$
10.  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$
11.  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$
12.  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$
13.  $0 + \frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
14.  $1 + \frac{1}{4} + \frac{1}{4} = 1\frac{2}{4}$
15.  $1\frac{1}{4} + \frac{1}{4} = 1\frac{2}{4}$
16.  $1\frac{1}{4} + \frac{1}{4} = 1\frac{2}{4}$
17.  $2 + \frac{1}{4} + \frac{1}{4} = 2\frac{2}{4}$

Try these without looking at the number line.

18.  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$
19.  $1\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 1\frac{3}{4}$



## Objective 119

Find equal fractions by using pictures and number lines.

### Vocabulary

Equal fractions

### Materials

- Measuring cups (Math Kit)
- Pint, quart containers
- Water
- Fraction Bars (Teaching Aid I or Math Kit)

## Introduction

**Motivational Situation** Pose this problem to students. How could you and a friend share a quart of milk equally but one of you gets two equal glassfuls and the other gets four equal glassfuls? [Each would get a pint of milk, but one pours the milk into two equal glasses that measure one cup each, and the other pours the milk into four equal glasses that measure one half cup each.] You may wish to demonstrate this situation with measuring cups and water.

## Using the Pages

**Teach** Using Concrete Materials For Example A, encourage students to use 2 fraction bars of wholes to represent the 2 loaves. Students should identify how many people had bread. [4] Then they should use their models to determine what part of one loaf each person had. [1/2 loaf] Students should conclude that Mr. and Mrs. Renner each had 1/2 loaf, Amanda had 1/2 loaf that was cut into 2 pieces, and David had 1/2 loaf that was cut into 4 pieces. In Example B, reinforce students' understanding of fractions by having them count the sections that make up one whole on each fraction bar. There are two sections on the halves bar, three sections on the thirds bar, four sections on the fourths bar, and so on. When working through the example, have students place the fraction bars for 1/2 on their desks. Then have them place the fraction bar for fourths over 1/2 to see how many fourths make up the same amount as 1/2. Have students write the sentence that shows the equal fractions. Repeat the activity for sixths, eighths, and tenths.

To extend Example C, have students find fractions equal to 3/4, 2/6, and 4/10. [3/4 = 6/8, 9/12; 2/6 = 1/3, 4/12; 4/10 = 2/5]

**Try** Using Concrete Materials For Exercise e, students use their fraction bars marked in sixths to mark off the distance equal to 2/12 on a new fraction (Continued on page 319.)

## Equal Fractions

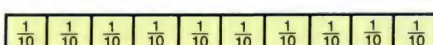
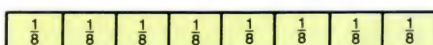
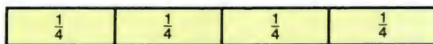
See Using the Pages for a discussion of these examples.  
Work in groups of 4.

- A.** Mrs. Renner had two mini-loaves of French bread. She cut them into pieces for her family. Each person got the same amount of the bread with none left over. Mr. and Mrs. Renner each had 1 piece, Amanda had 2 equal pieces, and David had 4 equal pieces. How can this be?

Discuss this situation in your group. Be prepared to show how this can be and explain your thinking to the class.



- B.** You can use fraction bars to show that two fractions are equal.



Cut out your fraction bars.

Compare the fraction bar that is in halves with each of the other fraction bars.

How many fourths equal one half?  $\frac{2}{4} = \frac{1}{2}$

How many sixths equal one half?  $\frac{3}{6} = \frac{1}{2}$

$\frac{4}{8} = \frac{1}{2}$        $\frac{5}{10} = \frac{1}{2}$

How many twelfths equal one half? Write a sentence to show this.  $\frac{6}{12} = \frac{1}{2}$

- C.** Use fraction bars to find some fractions equal to  $\frac{1}{3}$ .  
 $\frac{2}{6} = \frac{1}{3}$ ;  $\frac{3}{9} = \frac{1}{3}$

**Try** Use fraction bars to find the equal fractions.

- a.**  $\frac{1}{5} = \frac{2}{10}$       **b.**  $\frac{2}{4} = \frac{4}{8}$       **c.**  $\frac{3}{9} = \frac{4}{12}$       **d.**  $\frac{2}{3} = \frac{4}{6}$

- e.** Make a fraction bar that is marked in twelfths to go with your set of fraction bars. One sixth and two twelfths are equal fractions. How does this help you make the fraction bar?

Using the fraction bar for sixths, divide each of the sixths in half.

- f.** Use equal fractions to explain how each of the Renners got the same amount of French bread.

See margin.

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## Practice 119

Name \_\_\_\_\_

Use the pictures to help you find equal fractions.

1.  $\frac{1}{2} = \frac{2}{4}$

2.  $\frac{2}{5} = \frac{4}{10}$

3.  $\frac{3}{6} = \frac{4}{8}$

4.  $\frac{2}{3} = \frac{4}{6}$

Use the number lines to complete each pair of equal fractions.

5.  $\frac{2}{3} = \frac{4}{6}$       6.  $\frac{3}{4} = \frac{6}{8}$

7.  $\frac{1}{2} = \frac{2}{4}$       8.  $\frac{2}{5} = \frac{4}{10}$

9.  $\frac{1}{3} = \frac{2}{6}$       10.  $\frac{3}{6} = \frac{4}{8}$

11.  $\frac{2}{10} = \frac{4}{20}$       12.  $\frac{3}{15} = \frac{6}{30}$

13.  $\frac{5}{10} = \frac{10}{20}$       14.  $\frac{6}{12} = \frac{12}{24}$

## Reteaching 119

Name \_\_\_\_\_

Use the pictures to help you find equal fractions.

1. 2 parts are shaded. There are 4 equal parts.  $\frac{2}{4} = \frac{4}{8}$

2. 4 parts are shaded. There are 8 equal parts.  $\frac{4}{8} = \frac{8}{16}$

3.  $\frac{2}{4} = \frac{4}{8}$

4.  $\frac{3}{6} = \frac{4}{8}$

5.  $\frac{3}{6} = \frac{4}{8}$

Use the number lines.

Find equal fractions.

6.  $\frac{1}{2} = \frac{2}{4}$       7.  $\frac{1}{3} = \frac{2}{6}$       8.  $\frac{2}{5} = \frac{4}{10}$

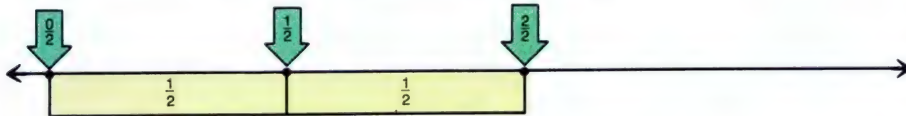
9.  $\frac{3}{6} = \frac{4}{8}$       10.  $\frac{4}{10} = \frac{8}{20}$       11.  $\frac{5}{10} = \frac{10}{20}$



**Practice** Use fraction bars to find the equal fractions.

1.  $\frac{3}{4} = \frac{\text{■}}{8}$  **6**
2.  $\frac{2}{3} = \frac{\text{■}}{6}$  **4**
3.  $\frac{4}{5} = \frac{\text{■}}{10}$  **8**
4.  $\frac{3}{9} = \frac{\text{■}}{3}$  **1**
5.  $\frac{\text{■}}{9} = \frac{2}{3}$  **6**
6.  $\frac{\text{■}}{4} = \frac{8}{8}$  **4**
7.  $\frac{\text{■}}{5} = \frac{4}{10}$  **2**
8.  $\frac{\text{■}}{8} = \frac{1}{4}$  **2**
9.  $\frac{1}{3} = \frac{\text{■}}{6}$  **2**
10.  $\frac{8}{10} = \frac{\text{■}}{5}$  **4**
11.  $\frac{\text{■}}{3} = \frac{8}{12}$  **2**
12.  $\frac{\text{■}}{6} = \frac{10}{12}$  **5**

You can use fraction bars to draw number lines. Draw a line. Mark off a segment that is the length of the bar marked in halves. Locate and label the points that correspond to  $\frac{0}{2}$ ,  $\frac{1}{2}$ , and  $\frac{2}{2}$ .



Draw another number line below the first. Mark off a segment that is the length of the bar marked in thirds. Locate and label the points that correspond to  $\frac{0}{3}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ , and  $\frac{3}{3}$ . Be sure the points that correspond to 0 line up directly beneath one another. You might use a colored pencil to draw a vertical line through the points.

Continue drawing number lines, one below another. Mark the lines successively in fourths, fifths, sixths, eighths, ninths, tenths, and twelfths.

How can you use number lines to find equal fractions? **See Using the Pages.**

Use your number lines to find the equal fractions.

13.  $\frac{3}{4} = \frac{\text{■}}{12}$  **9**
14.  $\frac{2}{3} = \frac{\text{■}}{12}$  **8**
15.  $\frac{\text{■}}{10} = \frac{3}{5}$  **6**
16.  $\frac{\text{■}}{6} = \frac{4}{8}$  **3**
17.  $\frac{3}{9} = \frac{\text{■}}{12}$  **4**
18.  $\frac{1}{4} = \frac{\text{■}}{8}$  **2**
19.  $\frac{\text{■}}{16} = \frac{1}{2}$  **8**
20.  $\frac{\text{■}}{20} = \frac{4}{10}$  **8**

**Apply** Solve each problem.

21. Explain why seven days in February (not a leap year) can be called one fourth of a month.
22. David said he slept for 8 hours. Amanda said, "You slept a third of a day." Explain.

**See margin.**

**See margin.**

**CALCULATOR** You can compare fractions by changing them to decimals. **Press:** numerator  $\div$  denominator  $=$ .

23. Which is smaller  $\frac{45}{75}$  or  $\frac{95}{125}$ ?
24. Which is larger  $\frac{128}{160}$  or  $\frac{112}{128}$ ?

More Practice Set 119, page 394 **319**

## Assignment Guide

basic 1–18, 21–24  
average 5–18, 21–24  
enriched 5–24

**More Practice 119,**  
**page 394**

(Continued from page 318.)

bar. They must draw 2 equal twelfths in the space of  $\frac{1}{6}$  on the new bar. They can continue marking off sixths and dividing them into twelfths until they have made  $\frac{12}{12}$ . For Exercise f, students should consider the two loaves of bread as two wholes, each divided into halves.

### Practice Using Concrete Materials

Students draw their own number lines for Exercises 13–20. Students should see that once they align the 0 and 1 on the number line with the ends of a fraction bar, they can mark off equal distances between 0 and 1 using the marks for the equal fractions on the bars.

**Apply Problem Solving** Encourage students to use fraction bars or number lines to solve these problems. For Problems 21 and 22, students must research the number of days in February and the number of hours in a day. [28; 24]

**Calculator** For Problems 23 and 24, review comparing decimals before students compare the fractions.

## Follow-Up

**Reteaching** Have students use fraction bars to show equal fractions by shading in a particular amount on one bar and then finding other fraction bars that show equal amounts.

### Computer Assisted Instruction

Mathematics Courseware Series

- Fractions 1, Activity 3a
- Fractions 3, Activity 1

### Daily Maintenance

Is the fraction equal to 1? Write yes or no.

1.  $\frac{5}{9}$  [No]
2.  $\frac{6}{3}$  [No]
3.  $\frac{4}{4}$  [Yes]
4.  $\frac{6}{7}$  [No]
5.  $\frac{8}{8}$  [Yes]

Answers, pages 318–319

See page 350 of this Teacher's Edition.

## Enrichment 119

Name \_\_\_\_\_ E119

**Which Pictures Are the Same?**

Match each fraction with as many equal fractions as you can find in the pictures. Write the letters of the pictures that match.

1.  $\frac{3}{4}$  **C, H**
2.  $\frac{2}{3}$  **F, K**
3.  $\frac{1}{2}$  **A, B, I**
4.  $\frac{2}{6}$  **G, J, L**
5.  $\frac{1}{3}$  **D, E**
6.  $\frac{2}{4}$  **M**

A. B. C. D. E. F. G. H. I. J. K. L. M.

## Additional Resource 119

Name \_\_\_\_\_ Additional Resource 119

**Maintenance**

Divide.

1.  $4\overline{)28}$  **7**
2.  $5\overline{)35}$  **7**
3.  $8\overline{)40}$  **5**
4.  $6\overline{)12}$  **2**
5.  $3\overline{)18}$  **6**
6.  $7\overline{)35}$  **5**
7.  $9\overline{)27}$  **3**
8.  $6\overline{)42}$  **7**
9.  $9\overline{)45}$  **5**
10.  $6\overline{)250}$  **41**
11.  $4\overline{)119}$  **29**
12.  $8\overline{)64}$  **8**

Solve each problem.

13. 29 students are going on a field trip. 5 students can ride in each car. How many cars are needed for the trip? **6 cars**
14. There are 25 tennis balls in a bucket. 3 balls will fit in each can. If the tennis balls are placed in cans, how many cans will be filled? **8 cans**



Add fractions with different denominators by using a number line.

## Art: Art Fair

- Number Lines (Teaching Aid A)
- Fraction model (Punchouts)

**Motivational Situation** Pose this problem to your students. Suppose your school planned an art fair. Name some situations where fractions would be used. [What fractional part of the art work would be oil paintings, sculptures, pottery, watercolors, and so on; what fractional part of the art work would be done by each grade; what fractional part of the student body would work each day; what fractional part of the art work was sold each day?]

**Teach** Read and discuss Example A. Have students model the example and then record as shown. Students should notice that the denominator of the sum is the same as that of the addends, and that the numerator of the sum is the sum of the numerators of the addends. A rule for adding fractions with the same denominator is to first add the numerators and then write the sum over the denominator.

**Try** For Examples a-d, have students first identify which addend must be re-named as an equal fraction. Stress that the denominators must be the same before adding.

320 Chapter 11

**A.** At an art fair,  $\frac{2}{8}$  of the space was used to display wax or wood carvings and  $\frac{3}{8}$  of the space was used to display paintings. What fraction of the space was used for carvings or paintings?

On pages 316–317 you used models to add fractions. Use your punchout fraction models to add the fractions.

$\frac{5}{8}$  of the tables were used for wax or wood carvings.

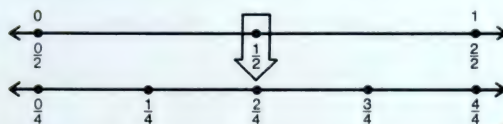
Here is a way to record your work.

$$\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

The denominators of the two fractions are the same. What do you notice about the denominator of the sum? What can you say about the numerator of the sum? Write a rule for adding fractions with the same denominator.

**B.** To find the sum of two fractions with different denominators, it is helpful to use number lines.

Use number lines to find  $\frac{3}{4} + \frac{1}{2}$ .



$$\frac{3}{4} = \frac{3}{4}$$

$$+\frac{1}{2} = \frac{2}{4}$$

$$\frac{1}{2} = \frac{2}{4}$$

Add the numerators.  
Use the same denominator.



320

Name \_\_\_\_\_

P120

Use the number lines above. Add.

$$1. \frac{3}{4} + \frac{1}{2} = \frac{5}{4} \quad 2. \frac{1}{4} + \frac{3}{12} = \frac{6}{12} \quad 3. \frac{1}{3} + \frac{2}{6} = \frac{5}{6}$$

$$4. \frac{5}{6} + \frac{0}{12} = \frac{5}{6} \quad 5. \frac{1}{2} + \frac{5}{8} = \frac{9}{8} \quad 6. \frac{1}{8} + \frac{3}{4} = \frac{7}{8}$$

$$7. \frac{5}{12} + \frac{1}{6} = \frac{7}{12} \quad 8. \frac{5}{12} + \frac{1}{3} = \frac{9}{12} \quad 9. \frac{3}{4} + \frac{8}{8} = \frac{14}{8}$$

$$10. \frac{1}{2} + \frac{1}{12} = \frac{7}{12} \quad 11. \frac{1}{4} + \frac{5}{8} = \frac{7}{8} \quad 12. \frac{1}{4} + \frac{1}{3} = \frac{5}{6} \quad 13. \frac{7}{12} + \frac{1}{12} = \frac{10}{12}$$

$$14. \frac{3}{4} + \frac{5}{8} = \frac{9}{8} \quad 15. \frac{5}{12} + \frac{3}{4} = \frac{14}{12} \quad 16. \frac{5}{6} + \frac{1}{12} = \frac{11}{12} \quad 17. \frac{3}{4} + \frac{3}{8} = \frac{9}{8}$$

R120

Name \_\_\_\_\_

Find  $\frac{3}{8} + \frac{1}{6}$

6 is the larger denominator.

Use the number lines to write  $\frac{3}{8}$  with a denominator of 6.

$$\frac{3}{8} = \frac{3 \times 3}{8 \times 3} = \frac{9}{24}$$

$$\frac{1}{6} = \frac{1 \times 4}{6 \times 4} = \frac{4}{24}$$

*What should you do if you break your toe?*

Add. Match each letter to its answer in the blanks below.

1.  $\frac{1}{3} + \frac{1}{12} = \frac{5}{12}$  T

2.  $\frac{4}{6} + \frac{1}{2} = \frac{5}{6}$  T

3.  $\frac{2}{3} + \frac{2}{3} = \frac{11}{12}$  E

4.  $\frac{5}{6} + \frac{5}{12} = \frac{15}{12}$  A

5.  $\frac{11}{12} + \frac{1}{2} = \frac{17}{12}$  C

6.  $\frac{1}{3} + \frac{5}{6} = \frac{7}{6}$  U

7.  $\frac{2}{3} + \frac{3}{6} = \frac{9}{6}$  O

8.  $\frac{2}{3} + \frac{2}{3} = \frac{6}{6}$  R

9.  $\frac{7}{12} + \frac{1}{6} = \frac{13}{12}$  K

Call

| A               | T              | O             | E               | T             | R             | U             | C               | K               |
|-----------------|----------------|---------------|-----------------|---------------|---------------|---------------|-----------------|-----------------|
| $\frac{15}{12}$ | $\frac{5}{12}$ | $\frac{9}{6}$ | $\frac{11}{12}$ | $\frac{4}{6}$ | $\frac{8}{6}$ | $\frac{7}{6}$ | $\frac{12}{12}$ | $\frac{13}{12}$ |



## Assignment Guide

basic 1–13, 15–16  
average 1–13, 15–17  
enriched 1–18

**More Practice Set 120,**  
page 394

(Continued from page 320.)

**Practice** Exercise 14 is starred because students must rewrite both fractions with a denominator of 12 to do the exercise correctly.

**Estimation** Have students estimate the sum of each exercise. Review with the students how to tell if a fraction is greater than or less than  $\frac{1}{2}$ . (See page 307 of this Teacher's Edition.) Explain that if both fractions are less than  $\frac{1}{2}$ , their sum will be less than one, and if both fractions are greater than  $\frac{1}{2}$ , their sum will be greater than one. If one fraction is greater than  $\frac{1}{2}$ , and the other fraction is less than  $\frac{1}{2}$  the sum can be estimated as greater than  $\frac{1}{2}$  because one fraction is greater than  $\frac{1}{2}$ .

**Apply Problem Solving** Ask a student in each group to restate Problems 15 and 16 for the group. Permit other students to ask the first student questions about the problems. Have students suggest as many strategies for each problem as possible.

**Use a physical model** For Problem 18, have students use circular fraction models to explore what part of a twelve-hour period 1 hour is [ $\frac{1}{12}$ ], 2 hours [ $\frac{2}{12}$  or  $\frac{1}{6}$ ], 3 hours [ $\frac{3}{12}$  or  $\frac{1}{4}$ ].

## Follow-Up

**Extra Practice** Draw number lines for halves, fifths, and tenths, and have students do these exercises.

$$1. \frac{1}{5} + \frac{7}{10} \left[ \frac{9}{10} \right] \quad 2. \frac{1}{5} + \frac{2}{10} \left[ \frac{4}{10} \right]$$

$$3. \frac{3}{5} + \frac{1}{10} \left[ \frac{7}{10} \right] \quad 4. \frac{1}{2} + \frac{1}{5} \left[ \frac{7}{10} \right]$$

## Daily Maintenance

$$1. 9 \times 27 \quad [243]$$

$$2. 3 \times 56 \quad [168]$$

$$3. 5 \times 39 \quad [195]$$

$$4. 2 \times 75 \quad [150]$$

$$5. 7 \times 48 \quad [336]$$

$$6. 4 \times 96 \quad [384]$$

**Using Problem-Solving Strategies,** page 430



**Try** Add. Use the number lines above.

a.  $\frac{1}{4} + \frac{5}{8} = \frac{7}{8}$

b.  $\frac{5}{6} + \frac{3}{6} = \frac{8}{6}$

c.  $\frac{1}{3} + \frac{5}{12} = \frac{9}{12}$

d.  $\frac{3}{4} + \frac{1}{12} = \frac{10}{12}$

**Practice** Add. Use the number lines above.

1.  $\frac{2}{3} + \frac{1}{6} = \frac{5}{6}$

2.  $\frac{2}{3} + \frac{1}{12} = \frac{9}{12}$

3.  $\frac{3}{4} + \frac{3}{8} = \frac{9}{8}$

4.  $\frac{5}{6} + \frac{1}{3} = \frac{7}{6}$

5.  $\frac{1}{8} + \frac{7}{8} = \frac{8}{8}$

6.  $\frac{5}{6} + \frac{5}{12} = \frac{15}{12}$

7.  $\frac{2}{4} + \frac{5}{6} = \frac{8}{6}$

8.  $\frac{7}{12} + \frac{1}{4} = \frac{10}{12}$

9.  $\frac{1}{4} + \frac{6}{8} = \frac{8}{8}$

10.  $\frac{1}{3} + \frac{7}{12} = \frac{11}{12}$

11.  $\frac{5}{12} + \frac{2}{6} = \frac{7}{6}$

12.  $\frac{6}{8} + \frac{7}{12} = \frac{16}{12}$

13.  $\frac{5}{12} + \frac{7}{12} = \frac{12}{12}$

\*14.  $\frac{1}{4} + \frac{1}{6} = \frac{5}{12}$

**Apply** Work these problems with 3 other students.

15. Celia used  $\frac{3}{4}$  yard of blue ribbon and  $\frac{5}{8}$  yard of red ribbon. Explain how you can tell that she used less than 2 yards of ribbon without adding. **Both fractions are less than one. Therefore, their sum is less than two.**

17. **Thinking skills** A fraction that is less than 1 is a proper fraction. What is true about the sum of any 2 proper fractions? About the sum of any 3 proper fractions?

**Sum is less than 2; sum is less than 3.**

16. How many yards of ribbon did Celia actually use?

**$\frac{11}{8}$  yard**

18. **Write a problem.** Write a problem about fractional parts of the day. Have someone solve the problem.

**Answers will vary.**

Using Problem-Solving Strategies, page 430  
More Practice Set 120, page 394 **321**

## Enrichment 120

Name \_\_\_\_\_

**Pick Two**

Choose 2 fractions in the circles to complete the number sentence.

$\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$

Choose fractions from the circles to complete the number sentences.

1.  $\frac{1}{4} + \frac{5}{8} = \frac{7}{8}$

2.  $\frac{1}{12} + \frac{5}{12} = \frac{6}{12}$

3.  $\frac{1}{4} + \frac{1}{8} = \frac{3}{8}$

4.  $\frac{1}{12} + \frac{3}{4} = \frac{10}{12}$

5.  $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$

6.  $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$

7.  $\frac{5}{8} + \frac{1}{2} = \frac{7}{8}$

8.  $\frac{3}{4} + \frac{1}{2} = \frac{5}{4}$

9.  $\frac{1}{4} + \frac{9}{12} = \frac{10}{12}$

## Additional Resource 120

Name \_\_\_\_\_

**Maintenance**

Divide:

1.  $2 \overline{) 2748}$  **2R4**

2.  $5 \overline{) 1284}$  **5R29**

3.  $3 \overline{) 1150}$  **4R18**

4.  $5 \overline{) 1179}$  **3R23**

5.  $6 \overline{) 3265}$  **4R13**

6.  $7 \overline{) 0240}$  **3R30**

7.  $4 \overline{) 01899}$  **22R19**

8.  $2 \overline{) 1111}$  **4R19**

Use the information in the table to help you solve each problem.

9. A sheep weighs as much as how many chickens?  
**21 chickens**

10. A seal weighs as much as how many foxes?  
**14 foxes**

| Animal     | Weight     |
|------------|------------|
| Chicken    | 7 pounds   |
| Coyote     | 78 pounds  |
| Fox        | 14 pounds  |
| Seal       | 196 pounds |
| Sheep      | 147 pounds |
| Polar bear | 702 pounds |



Subtract fractions with the same denominator.

Reading: Fantasy

- Measuring cup
- Water
- Fraction Models (Punchouts)

**Using Concrete Materials** Show a clear measuring cup with  $\frac{2}{3}$  cup of water. Pour off  $\frac{1}{3}$  cup of water. Write  $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$  on the chalkboard. Then write  $\frac{7}{8} - \frac{6}{8}$  and ask what students think the answer is. [ $\frac{1}{8}$ ] Demonstrate the exercise using the measuring cup.

$$\frac{4}{5} - \frac{3}{5} = \frac{4-3}{5} = \frac{1}{5}$$

Point out that students can also write this example in vertical form.

**Practice** **Estimation** After the students have completed the exercises, have them tell if each answer is greater than or less than  $\frac{1}{2}$ . Remind students that they can quickly determine this by comparing the numerator and the denominator of each fraction. If the denominator is more than twice as great as the numerator, the fraction is less than  $\frac{1}{2}$ . If the denominator is less than twice as great, the fraction is greater than  $\frac{1}{2}$ . If the denominator is exactly twice the numerator, the fraction is equal to  $\frac{1}{2}$ .

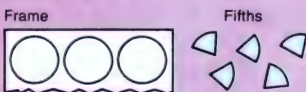
**Draw a picture** It may help students who have difficulty with Problem 19 to draw a picture.

Students can then see that they can add  $\frac{2}{3} + \frac{2}{3} + \frac{2}{3}$  to find how many yallows he started with.

Toby and Remlar live on the planet Zyp. Toby lives  $\frac{4}{5}$  zepton from school. Remlar lives  $\frac{3}{5}$  zepton from school. How much farther from school does Toby live?

Find  $\frac{4}{5} - \frac{3}{5}$ .

Use your punchout fraction models.



Place four fifths in a circle.  
Take three of the fifths away.  
What fraction of the whole is left?

How much farther from school does Toby live?

**zepton**

Here is a way to record your work.

$$\frac{4}{5} - \frac{3}{5} = \frac{1}{5}$$

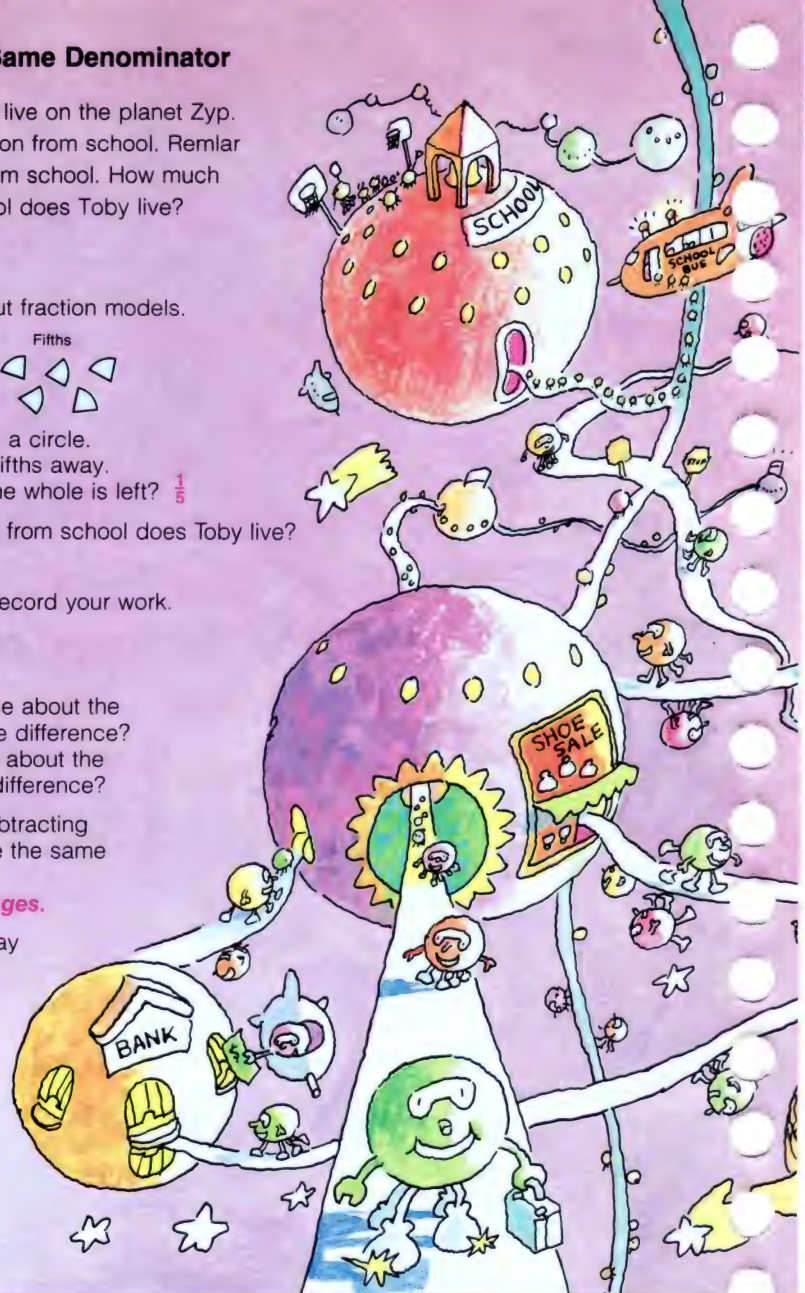
What do you notice about the denominator of the difference?  
What can you say about the numerator of the difference?

Write a rule for subtracting fractions that have the same denominator.

**See Using the Pages.**

Here is another way  
to write  $\frac{4}{5} - \frac{3}{5}$ .

$$\begin{array}{r} 4\frac{4}{5} \\ - 3\frac{3}{5} \\ \hline 1\frac{1}{5} \end{array}$$

[illegible]

Name \_\_\_\_\_

**R121**

Find  $\frac{4}{5} - \frac{1}{5}$ .

$$\frac{4}{5} - \frac{1}{5} = \frac{4-1}{5} = \frac{3}{5}$$

The denominators are the same.  
Subtract the numerators.

$$\begin{array}{r} 4 \\ -1 \\ \hline 3 \end{array}$$

4-1

*What do you call a country where everyone drives red cars?*

Subtract. Match the letters to the answers below.

1.  $\frac{4}{7} - \frac{2}{7} = \frac{4-2}{7} = \frac{\text{ } }{7}$     **A**

2.  $\frac{4}{5} - \frac{1}{5} = \frac{4-1}{5} = \frac{\text{ } }{5}$     **I**

3.  $\frac{3}{5} - \frac{1}{5} = \frac{3-1}{5} = \frac{\text{ } }{5}$     **D**

4.  $\frac{11}{12} - \frac{5}{12} = \frac{11-5}{12} = \frac{\text{ } }{12}$     **N**

5.  $\frac{7}{8} - \frac{1}{8} = \frac{7-1}{8} = \frac{\text{ } }{8}$     **T**

6.  $\frac{2}{4} - \frac{1}{4} = \frac{2-1}{4} = \frac{\text{ } }{4}$     **E**

7.  $\frac{6}{6} - \frac{1}{6} = \frac{6-1}{6} = \frac{\text{ } }{6}$     **H**

8.  $\frac{3}{4} - \frac{1}{4} = \frac{3-1}{4} = \frac{\text{ } }{4}$     **O**

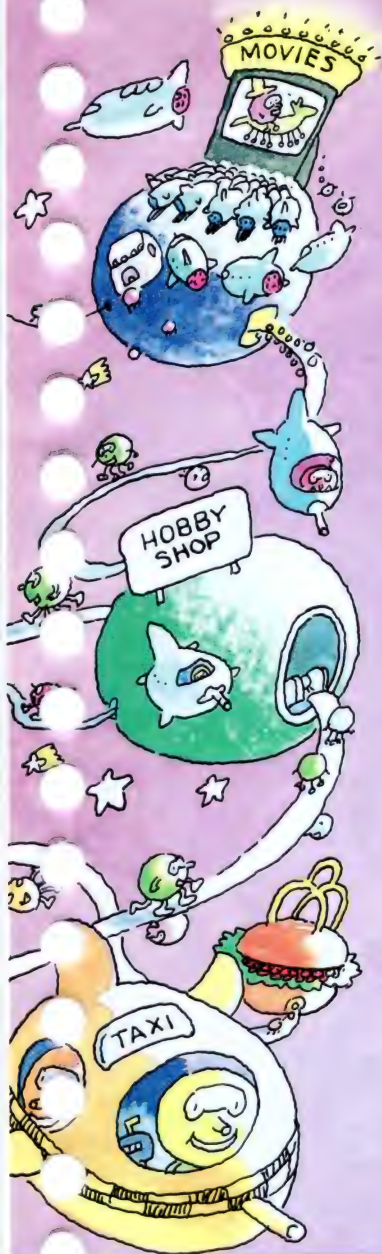
9.  $\frac{7}{7} - \frac{1}{7} = \frac{7-1}{7} = \frac{\text{ } }{7}$     **R**

10.  $\frac{7}{8} - \frac{1}{8} = \frac{7-1}{8} = \frac{\text{ } }{8}$     **C**

Match the letters to the answers below:

|              |              |              |              |              |              |
|--------------|--------------|--------------|--------------|--------------|--------------|
| <br><b>R</b> | <br><b>E</b> | <br><b>D</b> |              | <br><b>F</b> | <br><b>G</b> |
| <br><b>I</b> | <br><b>J</b> | <br><b>M</b> | <br><b>N</b> | <br><b>S</b> | <br><b>T</b> |
| <br><b>U</b> | <br><b>U</b> | <br><b>V</b> | <br><b>W</b> | <br><b>X</b> | <br><b>Y</b> |





**Try** Subtract. Use your punchout fraction models.

a.  $\frac{7}{6} - \frac{2}{3}$  b.  $\frac{9}{12} - \frac{4}{12}$  c.  $\frac{5}{10} - \frac{1}{10}$  d.  $\frac{14}{8} - \frac{7}{8}$

**Practice** Subtract. Use your punchout fraction models if you need them.

1.  $\frac{4}{10} - \frac{1}{10}$  2.  $\frac{5}{7} - \frac{3}{7}$  3.  $\frac{3}{10} - \frac{2}{10}$   
 4.  $\frac{1}{10} - \frac{1}{10}$  5.  $\frac{1}{2} - \frac{0}{2}$  6.  $\frac{2}{4} - \frac{1}{4}$   
 7.  $\frac{5}{10} - \frac{3}{10}$  8.  $\frac{4}{5} - \frac{1}{5}$  9.  $\frac{3}{9} - \frac{2}{9}$   
 10.  $\frac{10}{12} - \frac{4}{12}$  11.  $\frac{6}{8} - \frac{3}{8}$  12.  $\frac{10}{12} - \frac{6}{12}$   
 13.  $\frac{3}{4} - \frac{1}{4}$  14.  $\frac{3}{10} - \frac{1}{10}$  15.  $\frac{9}{10} - \frac{3}{10}$  16.  $\frac{8}{10} - \frac{3}{10}$

**Apply** Solve each problem.

- The distance from Toby's house to the spaceport is  $\frac{4}{3}$  zeptron. Toby has walked  $\frac{1}{4}$  zeptron towards the spaceport. How much farther does he have to walk?  
 **$\frac{4}{3}$  zeptron**
- At the spaceport,  $\frac{1}{6}$  of the 36 spaceships were being refueled. How many spaceships were being refueled?  
**6 spaceships**
- Toby used  $\frac{2}{3}$  of the fuel in his power pack. He had  $\frac{3}{2}$  vallow left. How many vallows of fuel did he start with?  
**2 vallows**
- In Toby's class,  $\frac{5}{8}$  of the students have spaceships. What fraction of the students do not have spaceships?  
 **$\frac{3}{8}$  of the students**

More Practice Set 121, page 395 **323**

## Assignment Guide

basic 1–18  
average 1–18, 20  
enriched 1–20

**More Practice Set 121, page 395**

## Follow-Up

**Extra Practice** In the following squares, have students subtract across and down.

|                 |                 |                 |
|-----------------|-----------------|-----------------|
| $\frac{6}{7}$   | $\frac{3}{7}$   | $[\frac{3}{7}]$ |
| $\frac{4}{7}$   | $\frac{2}{7}$   | $[\frac{2}{7}]$ |
| $[\frac{2}{7}]$ | $[\frac{1}{7}]$ | $[\frac{1}{7}]$ |

|                  |                  |                  |
|------------------|------------------|------------------|
| $\frac{9}{10}$   | $\frac{5}{10}$   | $[\frac{4}{10}]$ |
| $\frac{2}{10}$   | $\frac{1}{10}$   | $[\frac{1}{10}]$ |
| $[\frac{7}{10}]$ | $[\frac{4}{10}]$ | $[\frac{3}{10}]$ |

**Enrichment Write a problem** Have students write problems with fantasy themes, that involve subtraction of fractions with the same denominator.

## Calculator

Have students subtract the following fractions and record their answers. Then have them change each fraction to a decimal and subtract and record their answers. Finally, have them change their fraction answer to a decimal to see that both answers are equal.

- $\frac{4}{5} - \frac{1}{5}$  [ $\frac{3}{5}$ ,  $0.8 - 0.2 = 0.6$ ,  $\frac{3}{5} = 0.6$ ]
- $\frac{6}{8} - \frac{2}{8}$  [ $\frac{4}{8}$ ,  $0.75 - 0.25 = 0.5$ ,  $\frac{4}{8} = 0.5$ ]
- $\frac{2}{4} - \frac{1}{4}$  [ $\frac{1}{4}$ ,  $0.50 - 0.25 = 0.25$ ,  $\frac{1}{4} = 0.25$ ]
- $\frac{9}{12} - \frac{9}{12}$  [ $\frac{0}{12}$ ,  $0.75 - 0.75 = 0$ ,  $\frac{0}{12} = 0$ ]
- $\frac{13}{10} - \frac{7}{10}$  [ $\frac{6}{10}$ ,  $1.3 - 0.7 = 0.6$ ,  $\frac{6}{10} = 0.6$ ]

**Computer Assisted Instruction**  
Mathematics Courseware Series  
• Fractions 2, Activity 2

## Daily Maintenance

- $26.7 - 3.6$  [23.1]
- $87.3 - 29.5$  [57.8]
- $90.90 - 63.95$  [26.95]
- $200 - 106.3$  [93.7]
- $36.7 - 12.9$  [23.8]
- $400 - 23.6$  [376.4]

## Enrichment 121

Name \_\_\_\_\_

**Fraction Sentences** E121

Fill in the empty boxes to make every number sentence true!

## Additional Resource 121

Name \_\_\_\_\_

**Additional Resource 121**

**Maintenance**

Multiply or divide.

- $\begin{array}{r} 42 \\ \times 7 \\ \hline 294 \end{array}$
- $\begin{array}{r} 53 \\ \times 60 \\ \hline 3,180 \end{array}$
- $\begin{array}{r} 534 \\ \times 40 \\ \hline 21,360 \end{array}$
- $\begin{array}{r} 453 \\ \times 26 \\ \hline 11,778 \end{array}$
- $\begin{array}{r} 22R2 \\ 5 \overline{)9200} \end{array}$
- $\begin{array}{r} 15 \\ 6 \overline{)50750} \end{array}$
- $\begin{array}{r} 3R30 \\ 7 \overline{)66234} \end{array}$
- $\begin{array}{r} 24R1 \\ 8 \overline{)16385} \end{array}$

Solve each problem.

- Willie earns \$288 in a week. How much does he earn in a year? (One year has 52 weeks.)  
**\$14,976**
- A playground swing set can safely hold only 900 pounds. If each child weighs an average of 85 pounds, how many children can swing at one time?  
**10 children**



## Objective 122

Subtract fractions with different denominators by using a number line.

### Lesson Theme

Reading: Fantasy

### Materials

- Number Lines (Teaching Aid A)

### Introduction

**Using Concrete Materials** Have students fold a square of paper twice to show fourths and write  $\frac{1}{4}$  on each section. Use the paper to review how many fourths equal  $\frac{1}{2}$ . [ $\frac{2}{4}$ ] Get students' ideas on how to find  $\frac{1}{2} - \frac{1}{4}$ . [Since  $\frac{1}{2}$  is equal to  $\frac{2}{4}$ , we can substitute  $\frac{2}{4}$  and subtract.  $\frac{2}{4} - \frac{1}{4} = \frac{1}{4}$ ]

### Using the Pages

**Teach** In Example A, stress using the number lines to find the fraction equal to  $\frac{2}{3}$  and that has the same denominator as  $\frac{5}{9}$ . Point out that subtraction of fractions can be written horizontally or vertically.

**Try** In Exercise b, notice that  $\frac{2}{4}$  can be written with a denominator of 6, using the number lines. Stress that the denominators must be the same in order to subtract.

**Practice** Students should begin to see that the larger denominator can be used as the denominator for the pairs of fractions encountered in this lesson. Exercise 16 is starred because it involves finding equal fractions for both  $\frac{1}{3}$  and  $\frac{1}{4}$  before subtracting.

**Error Analysis** Watch for students who subtract both the numerator and the denominator. Explain that the denominators in the answer should be the same as the like denominators in the exercises. Only the numerators are subtracted. (See Reteaching 122.)

**Apply Problem Solving** Encourage students to describe the action in each problem before they begin to solve it.

**Use logical reasoning** Ask students what types of units of measurement they think a blip and a zeptron are. [Time, distance] Have students find other units on pages 322–325 and tell what the units represent. Then have students invent other units of measurement that might be used by Toby and Remlar.

**Calculator** Have students compare how their calculators show an overflow in Problem 19.

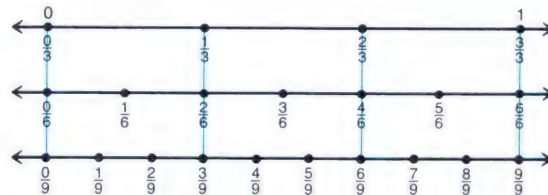
## Subtraction: Different Denominators



- A. In a timed spaceship race, Toby finished the race in  $\frac{2}{3}$  blip. Remlar finished in  $\frac{5}{9}$  blip. How much shorter was Remlar's time?

$$\text{Find } \frac{2}{3} - \frac{5}{9}.$$

The greater denominator is 9. Using the number lines, you can see that  $\frac{2}{3}$  can be written with a denominator of 9.



$$\frac{2}{3} - \frac{5}{9}$$

$$\frac{6}{9} - \frac{5}{9} = \frac{6-5}{9} = \frac{1}{9}$$

Subtract the numerators.  
Use the same denominator.

Remlar's time was  $\frac{1}{9}$  blip shorter than Toby's.

- B. Find  $\frac{5}{6} - \frac{1}{3}$ .

$$\frac{5}{6} - \frac{1}{3}$$

The greater denominator is 6. Look at the number lines.  
 $\frac{1}{3}$  can be written with a denominator of 6.  
 $5 - 2 = 3$



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## Practice 122

Subtract. Use the number lines. P122

## Reteaching 122

Name: \_\_\_\_\_ R122

Find  $\frac{7}{12} - \frac{2}{12}$ .

The larger denominator is 12.

So, find the equal fraction for  $\frac{2}{12}$  with a denominator of 12.

The number line shows that  $\frac{10}{12}$  is the equal fraction for  $\frac{5}{6}$ .

What state is known as "The Land of Enchantment"?

Subtract. Match each letter to its answer in the blanks below.

1.  $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$  C  
2.  $\frac{3}{6} - \frac{1}{6} = \frac{2}{6}$  W  
3.  $\frac{11}{12} - \frac{5}{12} = \frac{6}{12}$  X  
4.  $\frac{3}{12} - \frac{2}{12} = \frac{1}{12}$  E  
5.  $\frac{9}{12} - \frac{1}{12} = \frac{8}{12}$  I  
6.  $\frac{1}{12} - \frac{5}{12} = \frac{-4}{12}$  M  
7.  $\frac{7}{12} - \frac{0}{12} = \frac{7}{12}$  E  
8.  $\frac{2}{12} - \frac{7}{12} = \frac{-5}{12}$  E  
9.  $\frac{6}{12} - \frac{1}{12} = \frac{5}{12}$  O

N E W M E X I O



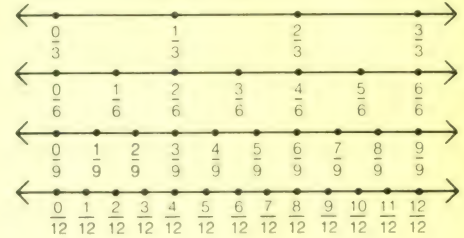
## Assignment Guide

basic 1–10, 17–19  
average 1–13, 17–19  
enriched 1–19

**More Practice Set 122,**  
page 395

## Follow-Up

**Extra Practice** Make up the number lines shown below. Then have students do the following exercises:



1.  $\frac{1}{3} - \frac{2}{9}$  [ $\frac{1}{9}$ ]      2.  $\frac{4}{6} - \frac{4}{9}$  [ $\frac{2}{9}$ ]
3.  $\frac{5}{6} - \frac{8}{12}$  [ $\frac{2}{12}$ ]      4.  $\frac{6}{9} - \frac{4}{12}$  [ $\frac{4}{12}$ ]
5.  $\frac{4}{12} - \frac{1}{6}$  [ $\frac{2}{12}$ ]      6.  $\frac{4}{9} - \frac{2}{6}$  [ $\frac{1}{9}$ ]

**Reteaching** Have three teams of two students each come to the front of the class and explain that they are the Debate Club. Identify the teams as Team A, Team B, and Team C. Last week Teams B and C were scheduled to debate. However, one member of Team C was absent. Tell the class that you want to know what part of the Debate Club participated in last week's debate. Develop the needed number sentence by asking these questions. What part of the Debate Club was scheduled to debate last week? [ $\frac{2}{3}$ ] What part of the Debate Club was absent last week? [ $\frac{1}{6}$ ] Write  $\frac{2}{3} - \frac{1}{6}$  on the board.

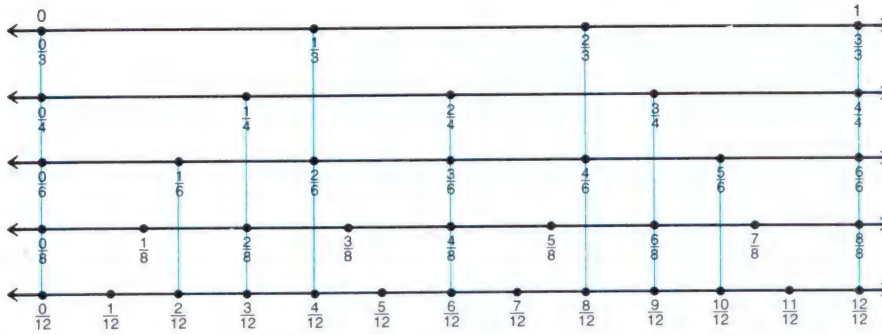
Point out that like denominators are needed for subtraction. Ask the students what fraction would tell what part of the Debate Club was scheduled to debate last week if we thought of the Debate Club as six individual students. [ $\frac{4}{6}$ ] Below the first sentence write  $\frac{4}{6} - \frac{1}{6}$ . Ask the students what part of the Debate Club participated in last week's debate. [ $\frac{3}{6}$ ]

## Cooperative Learning Groups

See page 484 of this Teacher's Edition.

## Daily Maintenance

1.  $1.7 + 2.8$  [4.5]
2.  $1.15 + 2.79$  [3.94]
3.  $4.09 + 0.56$  [4.65]
4.  $3.47 + 2.95$  [6.42]
5.  $42.8 + 3.7$  [46.5]
6.  $6.45 + 8.97$  [15.42]



**Try** Subtract. Use the number lines above.

- a.  $\frac{4}{6} - \frac{7}{12}$   $\frac{1}{12}$
- b.  $\frac{5}{6} - \frac{2}{4}$   $\frac{2}{6}$
- c.  $\frac{5}{12} - \frac{1}{6}$   $\frac{3}{12}$
- d.  $\frac{1}{3} - \frac{1}{6}$   $\frac{1}{6}$

**Practice** Subtract. Use the number lines above.

1.  $\frac{1}{3} - \frac{2}{12}$   $\frac{2}{12}$
2.  $\frac{3}{4} - \frac{3}{12}$   $\frac{6}{12}$
3.  $\frac{5}{8} - \frac{1}{4}$   $\frac{3}{8}$
4.  $\frac{8}{12} - \frac{2}{3}$   $\frac{0}{12}$
5.  $\frac{3}{4} - \frac{1}{8}$   $\frac{5}{8}$
6.  $\frac{1}{4} - \frac{1}{8}$   $\frac{1}{8}$
7.  $\frac{5}{6} - \frac{2}{3}$   $\frac{1}{6}$
8.  $\frac{3}{6} - \frac{1}{8}$   $\frac{3}{8}$
9.  $\frac{1}{8} - \frac{0}{4}$   $\frac{1}{8}$
10.  $\frac{4}{4} - \frac{4}{12}$   $\frac{8}{12}$
11.  $\frac{7}{12} - \frac{2}{6}$   $\frac{3}{12}$
12.  $\frac{10}{12} - \frac{1}{4}$   $\frac{7}{12}$
13.  $\frac{4}{6} - \frac{2}{3}$   $\frac{0}{6}$
14.  $\frac{11}{12} - \frac{5}{6}$   $\frac{1}{12}$
15.  $\frac{6}{8} - \frac{5}{12}$   $\frac{4}{12}$
16.  $\frac{1}{3} - \frac{1}{4}$   $\frac{1}{12}$

**Apply** Solve each problem.

17. The power pack on a spaceship has been recharging for  $\frac{1}{4}$  blip. It takes  $\frac{11}{12}$  blip to fully recharge. How much longer does the power pack need to recharge? Use the number lines above.  
 **$\frac{8}{12}$  blip**
18. Remlar's spaceship flew 348 zeprons in 12 blips. How many zeprons per blip did it travel?  
**29 zeprons per blip**
19. **Calculator** A calculator's display will overflow when an answer has too many digits for the display. Press: 99 999 999  $\div$  9  $=$ . How does your calculator show an overflow?  
**Answers will vary.**

More Practice Set 122, page 395 **325**

## Enrichment 122

**Magic Fraction Square**

Place your answers in the numbered boxes.

1.  $\frac{1}{3} \div \frac{1}{6}$
2.  $\frac{1}{2} \div \frac{1}{12}$
3.  $\frac{1}{3} \div \frac{1}{4}$
4.  $\frac{1}{3} \div \frac{1}{4}$
5.  $\frac{1}{12} \div \frac{1}{3}$
6.  $\frac{1}{3} \div \frac{1}{4}$
7.  $\frac{11}{12} \div \frac{1}{4}$
8.  $\frac{1}{3} \div \frac{1}{4}$
9.  $\frac{1}{2} \div \frac{1}{12}$

If all your answers are correct, this will be a magic square.

|    |    |    |
|----|----|----|
| 1. | 2. | 3. |
| 4. | 5. | 6. |
| 7. | 8. | 9. |

Magic Sum:  $1\frac{1}{2}$

Add the rows, columns, and diagonals to check your work.

## Additional Resource 122

**Maintenance**

Add, subtract, multiply, or divide. Watch the decimal points.

1.  $53.4 - 27 = 26.4$
2.  $4.31 + 5.97 = 10.28$
3.  $8.216 - 6.579 = 1.637$
4.  $5.02613 - 7.0906 = -2.06447$
5.  $72.5 \times 5.0 = 362.5$
6.  $8.00 \times 7.9 = 63.20$
7.  $2.09 \times 7.3 = 15.257$
8.  $8.42 \times 9.1 = 76.622$
9.  $3.519 \div 0.28 = 12.567857$
10.  $4.219 \div 5.7 = 0.7401754386$
11.  $6.312 \div 0.0 = \text{undefined}$
12.  $1.318 \div 0 = \text{undefined}$
13.  $6.788 - 8.39 = -1.602$
14.  $6.412 - 2.87 = 3.542$
15.  $5.431 - 5.42 = 0.011$
16.  $61.01 - 54.857 = 6.153$



## Using Problem-Solving Strategies

- Draw a diagram.
- List all possibilities.
- Make a table.
- Work backward.
- Try and check.
- Use logical reasoning.

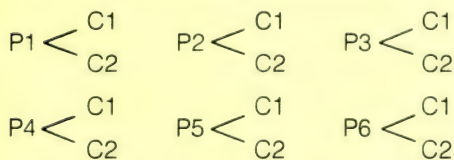
### Introduction

These problems provide an opportunity for students to use a variety of strategies.

### Using the Pages

Encourage students to think about problems that they have solved previously. This may suggest a strategy. If a group is having difficulty with a particular problem, ask questions which might help them to get started or suggest that they try a different problem and come back to that one later. Suggest a specific strategy only if it is absolutely necessary.

For Problem 1, some students may use a *diagram*: Let *P* represent pitchers and *C* represent catchers.



Others may give names to the pitchers and catchers and list the pitcher-catcher combinations.

Pitchers: Bob, Sam, Juan, Pete, Jim,  
Don

Catchers: Gary, Jack

Bob and Gary      Pete and Gary  
Bob and Jack      Pete and Jack

Sam and Gary      Jim and Gary  
Sam and Jack      Jim and Jack

Juan and Gary      Don and Gary  
Juan and Jack      Don and Jack

There are 12 pairs.

For Problem 2, students may *make a table* to determine when 100 baskets were made.

| Sat | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 20  | 30  | 40  | 50  | 60  | 70  | 80  | 90  | 100 |

Scott made 100 baskets on the ninth day.

## Using Problem-Solving Strategies

# PLAY BALL

Work in a group with three other students. Choose two of the following problems to solve in your group. Discuss with your group why each problem was chosen, how you plan to solve each problem, why your method will work, and if the same method can be used for both of the problems. When the problems have been solved, present your work to the rest of the class. If another group has solved the same problem, compare the problem-solving methods used.



1. A baseball team has six pitchers and two catchers. How many different pairs of pitchers and catchers can be chosen?  
**12 pairs**
2. Someday Scott is going to be a great basketball player. On Saturday, he made 20 baskets. Each day he makes 10 more baskets than the day before. On which day did he make 100 baskets?  
**9th day (Sunday)**
3. Fred gave one half of his baseball cards to Sally. Sally gave Jeff half of the cards that she got from Fred. Jeff gave Allen half of the cards that he got from Sally. Allen got 6 cards. How many cards did Fred originally have?  
**48 cards**

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For Problem 3, students *work backward* from Allen to Fred to determine the number of cards that Fred had. [48 cards]

|       |                    |
|-------|--------------------|
| Allen | 6                  |
| Jeff  | $6 \times 2 = 12$  |
| Sally | $12 \times 2 = 24$ |
| Fred  | $24 \times 2 = 48$ |

A *try-and-check* method might be used to solve Problem 4.

|       |       |           |       |       |           |
|-------|-------|-----------|-------|-------|-----------|
| Try 1 | Patty | 10        | Try 2 | Patty | 11        |
|       | Penny | 10        |       | Penny | 11        |
|       | Harry | 8         |       | Harry | 9         |
|       | Hank  | 8         |       | Hank  | 9         |
|       |       | <u>36</u> |       |       | <u>40</u> |

### Answers, page 327

#### 5. Quarters      Dimes      Nickels      Pennies

|   |   |   |    |
|---|---|---|----|
| 1 |   |   |    |
|   | 2 | 1 |    |
|   | 2 |   | 5  |
|   | 1 | 3 |    |
|   | 1 | 2 | 5  |
|   | 1 | 1 | 10 |
|   | 1 |   | 15 |
|   |   | 5 |    |
|   |   | 4 | 5  |
|   |   | 3 | 10 |
|   |   | 2 | 15 |
|   |   | 1 | 20 |
|   |   |   | 25 |

(Continued on page 327.)



## Assignment Guide

|          |                |
|----------|----------------|
| basic    | Any 2 problems |
| average  | Any 2 problems |
| enriched | Any 2 problems |

(Continued from page 326.)

For Problem 5, students *list the possible combinations* of coins totaling 25 cents. The list is given in the margin answers.

For Problem 6, students might design a tournament, giving the players names or numbers, and list the games played and won. See the margin answers for a sample.

For Problem 7, students may *try and check* to determine the number of field goals and free throws.

|       |                |           |
|-------|----------------|-----------|
| Try 1 | 10 free throws | 10 points |
|       | 20 field goals | 40 points |
|       |                | 50 points |

|       |                |           |
|-------|----------------|-----------|
| Try 2 | 15 free throws | 15 points |
|       | 30 field goals | 60 points |
|       |                | 75 points |

|       |                |           |
|-------|----------------|-----------|
| Try 3 | 13 free throws | 13 points |
|       | 26 field goals | 52 points |
|       |                | 65 points |

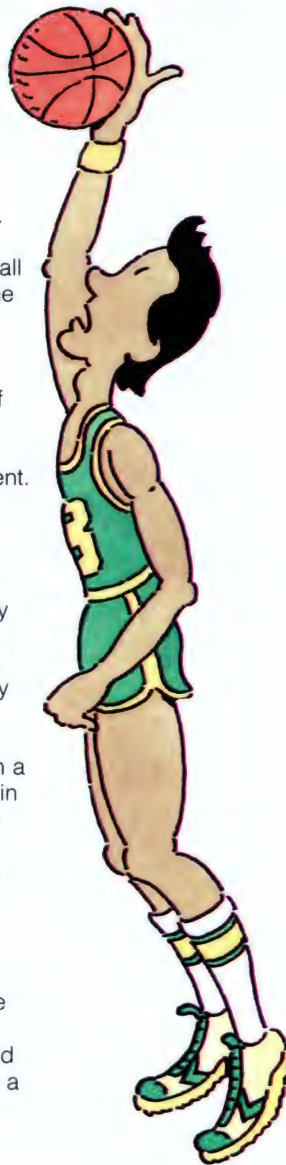
Students *use logical reasoning* to solve Problem 8. Students should conclude that since the Hornets won 1 game in the first round, they must have lost in the second round. Therefore, the Falcons won the championship.

Students may solve Problem 9 by considering *all the possibilities*. The only coins that Mrs. Cohen does not have are pennies, nickels, and half dollars. Since the price of a ticket is 50 cents, she would not need pennies to make change. She would need nickels if she were given 55 cents or 65 cents. She would not have been given 65 cents since a smaller amount (but larger than 50 cents) would be part of the 65 cents. Therefore, if she was given 55 cents as 1 quarter and 3 dimes, she could not give change.

## Daily Maintenance

- $33 \times 67$  [2,211]
- $48 \times 12$  [576]
- $54 \times 83$  [4,482]
- $47 \times 26$  [1,222]
- $39 \times 42$  [1,638]
- $51 \times 35$  [1,785]

Using Problem-Solving Strategies, page 431



- The Panther team has a set of twins, Patty and Penny. The Hawks also have a set of twins, Harry and Hank. The girls are 2 years older than the boys. The sum of all their ages is 40. How old are the girls? How old are the boys?  
**11 years old; 9 years old**
- Tickets for a football game cost \$2.75. If you give the ticket seller \$3.00, how many different combinations of coins might you get in change?  
**13 combinations**
- There are 10 players entered in a ping-pong tournament. If losing one game eliminates a player from the tournament, how many games have to be played to determine the winner?  
**9 games**
- A basketball team scored 65 points in one game. They made twice as many field goals as free throws. Each field goal scores 2 points, and each free throw scores 1 point. How many field goals and free throws did they make? **26 field goals, 13 free throws**
- The Hornets, Bulldogs, Falcons, and Raiders played in a local soccer tournament. There were 2 games played in the first round. In the second round the winners of the first-round games played for the championship. The Hornets defeated the Bulldogs in the first round. The Falcons played the Hornets in the second round. The Hornets won 1 game and lost 1 game in the tournament. Which team won the championship?  
**Falcons**
- Mrs. Cohen was selling tickets for a hockey game. The tickets were 50 cents each. Mrs. Cohen had dimes, quarters, dollar bills, and a ten-dollar bill, but she could not give change to the first person who wanted to buy a ticket. What did this person give to Mrs. Cohen?  
**1 quarter and 3 dimes**

Using Problem-Solving Strategies, page 431 **327**

6. A sample is given.

| Player | Winners of Round 1 | Winners of Round 2 | Winners of Round 3 | Winner of Tournament |
|--------|--------------------|--------------------|--------------------|----------------------|
|--------|--------------------|--------------------|--------------------|----------------------|



Number of Games  
 $5 + 2 + 1 + 1 = 9$



## Chapter 11 Test

An acceptable score for each objective is suggested on the Chapter 11 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| 111       | 1, 2       | 302-303    |
| 112       | 3          | 304-305    |
| 113       | 13, 14     | 306-307    |
| 114       | 4, 5       | 308-309    |
| 115       | 6          | 310-311    |
| 116       | 7, 8       | 312-313    |
| 117       | 21, 22     | 314-315    |
| 118       | 9, 10      | 316-317    |
| 119       | 15, 16     | 318-319    |
| 120       | 17, 18     | 320-321    |
| 121       | 11, 12     | 322-323    |
| 122       | 19, 20     | 324-325    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 22             | 100 | 16             | 73 |
| 21             | 95  | 15             | 68 |
| 20             | 91  | 14             | 64 |
| 19             | 86  | 13             | 59 |
| 18             | 82  | 12             | 55 |
| 17             | 77  | 11             | 50 |

### Additional Ideas for Evaluation

See pages 464-467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 11 Form for Individualizing
- Cumulative Record Folder

## Chapter 11 Test

Write a fraction to show how much of the figure is shaded.



$\frac{1}{4}$



$\frac{3}{6}$

3. What fraction of the letters are Bs? color

AAABBBBBB

Write each mixed number.

4. six and three fourths

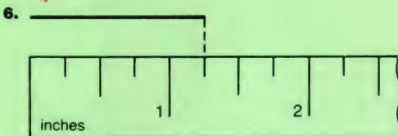
$6\frac{3}{4}$

5. ten and two thirds

$10\frac{2}{3}$

Give the length of this segment.

$1\frac{1}{4}$  in.



Find each answer.

7.  $\frac{1}{2}$  of 18

9

8.  $\frac{1}{6}$  of 42

7

Add.

9.  $\frac{2}{7} + \frac{4}{7}$

$\frac{6}{7}$

10.  $\frac{3}{5} + \frac{1}{5}$

$\frac{4}{5}$

Subtract.

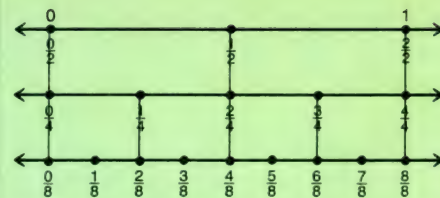
11.  $\frac{5}{6} - \frac{1}{6}$

$\frac{4}{6}$

12.  $\frac{4}{5} - \frac{3}{5}$

$\frac{1}{5}$

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Compare the fractions. Use  $<$ ,  $>$ , or  $=$ . Use the number lines above for Exercise 14.

13.  $\frac{1}{3}$  color  $\frac{2}{3}$

$<$

14.  $\frac{3}{4}$  color  $\frac{5}{8}$

$>$

Use the number lines above to help you find equal fractions.

15.  $\frac{1}{2} = \frac{4}{8}$

16.  $\frac{3}{4} = \frac{6}{8}$

Add. Use the number lines above.

17.  $\frac{5}{8} + \frac{1}{4}$

18.  $\frac{3}{4} + \frac{1}{2}$

Subtract. Use the number lines above.

19.  $\frac{3}{4} - \frac{1}{8}$

20.  $\frac{7}{8} - \frac{1}{2}$

Solve each problem. Draw a picture to help you.

21. A store had 24 kites.  $\frac{3}{8}$  of the kites were sold. How many kites were sold?

9 kites

22. Patty had 12 stickers. She used  $\frac{2}{3}$  of them. How many stickers did she use?

8 stickers

## Chapter 11 Letter Home

### Keeping You Posted

We have completed the chapter on fractions in our mathematics textbook. Our work included comparing fractions, adding and subtracting fractions, and writing mixed numbers. You might have your child help prepare a recipe that uses fractions. We will study graphs next.

To: Family

Match each mixed number or fraction on the left with a picture on the right.

Write a fraction and a mixed number for each picture.

$2\frac{1}{2}$

$\frac{1}{4}$

$\frac{3}{4}$

$\frac{5}{8}$

$\frac{4}{6}$

$1\frac{1}{6} = 1\frac{5}{6}$

$\frac{6}{8} = 2\frac{3}{4}$

$\frac{5}{2} = 2\frac{1}{2}$

$\frac{7}{4} = 1\frac{3}{4}$

$\frac{4}{3} = 1\frac{1}{3}$

## Chapter 11 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

### Posttest Chapter 11

Name: \_\_\_\_\_

Write a fraction to show how much of the figure is shaded.

1.

2.

3. What fraction of the letters are Fs? color

F F F G G G G

Write each mixed number.

4. three and two fifths

5. twelve and one eighth

Give the length of this segment.

6.

Find each answer.

7.  $\frac{1}{2}$  of 16

8.  $\frac{1}{5}$  of 56

Add.

9.  $\frac{2}{3} + \frac{1}{3}$

10.  $\frac{4}{5} + \frac{1}{5}$

Subtract.

11.  $\frac{5}{6} - \frac{1}{6}$

12.  $\frac{4}{5} - \frac{3}{5}$

### Posttest Chapter 11

Name: \_\_\_\_\_

Compare the fractions. Use  $<$ ,  $>$ , or  $=$ . Use the number lines above for Exercise 14.

13.  $\frac{1}{3}$  color  $\frac{2}{3}$

14.  $\frac{3}{4}$  color  $\frac{5}{8}$

Use the number lines above to help you find equal fractions.

15.  $\frac{1}{2} = \frac{4}{8}$

16.  $\frac{3}{4} = \frac{6}{8}$

Add. Use the number lines above.

17.  $\frac{5}{8} + \frac{1}{4}$

18.  $\frac{3}{4} + \frac{1}{2}$

Subtract. Use the number lines above.

19.  $\frac{3}{4} - \frac{1}{8}$

20.  $\frac{7}{8} - \frac{1}{2}$

Solve each problem. Draw a picture to help you.

21. A store had 25 kites.  $\frac{3}{5}$  of the kites were sold. How many kites were sold?

22. Wendy had 18 stickers. She used  $\frac{2}{3}$  of them. How many stickers did she use?

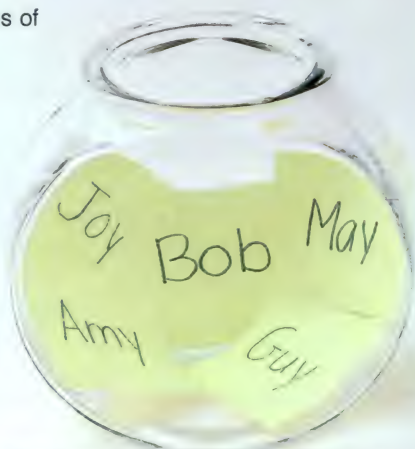
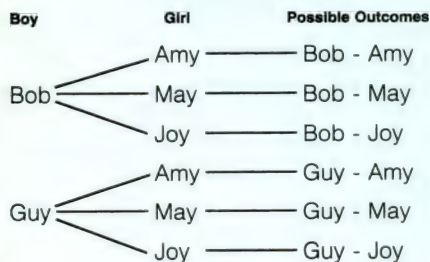


# CHALLENGE

## Probability: Listing Possible Outcomes

Ms. Lee will choose a boy and a girl as ushers for the school play. The boy chosen will be Bob or Guy. The girl chosen will be Amy, May, or Joy.

This tree diagram shows the possible outcomes of Ms. Lee's choices.



Find each answer.

- What fraction of times might Bob be an usher?  $\frac{\text{Choice of Bob}}{\text{Possible outcomes}} = \frac{2}{6}$
- What fraction of times might May be an usher?  $\frac{\text{Choice of May}}{\text{Possible outcomes}} = \frac{2}{6}$
- Draw a tree diagram to list the possible outcomes if the choices are among Amy, May, or Joy, and Bob, Guy, or Sam.  
**See margin.**
- What fraction of times might Joy be an usher?  $\frac{\text{Choice of Joy}}{\text{Possible outcomes}} = \frac{2}{6}$
- What fraction of times might Van be an usher?  $\frac{3}{12}$
- In Exercises 3 and 6, is it true that the number of girls times the number of boys equals the number of possible outcomes?  
**Yes**
- What fraction of times might Sam be an usher?  $\frac{\text{Choice of Sam}}{\text{Possible outcomes}} = \frac{3}{9}$
- Draw a tree diagram to list the possible outcomes if the choices are among Rita, Beth, or Dee, and Ken, Van, Ted, or Bill.  
**See margin.**
- What fraction of times might Dee be an usher?  $\frac{4}{12}$

## Challenge

You may wish to introduce this lesson by having students write these first names and middle initials on index cards, one name or initial to a card.

|      |     |       |    |    |
|------|-----|-------|----|----|
| Mona | Ray | Chris | J. | L. |
|------|-----|-------|----|----|

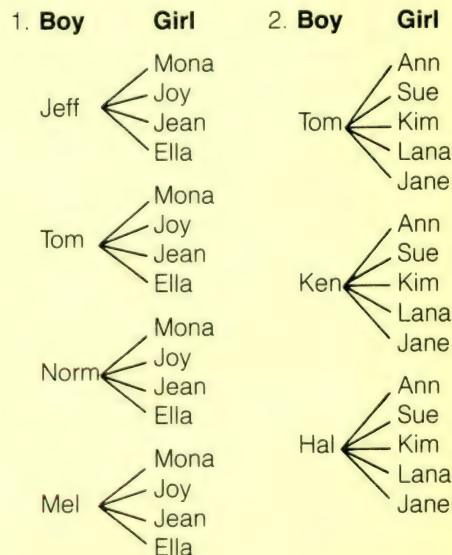
Have students use their index cards to make a name, using one first name and one middle initial. Then let them guess how many possible names they could make. Have them manipulate their cards and make a list of several possibilities. Ask if there might be a more systematic way to find the total possible outcomes. Some student might suggest that one could make a list of the names and initials, and then make a systematic pairing beginning with Mona and the first initial and then Mona and the second initial, and so on.

Repeat this activity using the names of the two boys and the three girls in the example on the pupil page. Then discuss how a tree diagram is just another way of listing possible outcomes systematically.

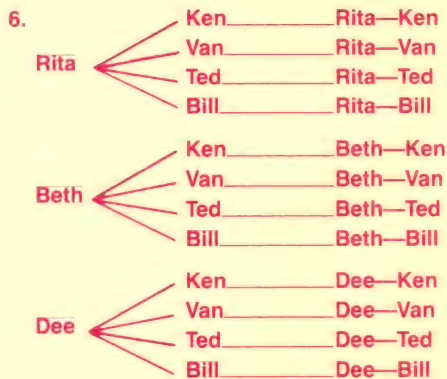
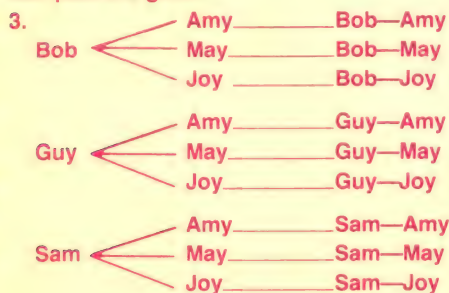
Make sure that students list every possible outcome for Exercises 3 and 6 before doing the other exercises.

You may want to extend this lesson by having students make tree diagrams for the following (answers below).

- 4 boys (Jeff, Tom, Norm, Mel) and 4 girls (Mona, Joy, Jean, Ella)
- 3 boys (Tom, Ken, Hal) and 5 girls (Ann, Sue, Kim, Lana, Jane)



Answers, page 329. Diagrams will vary. Samples are given.





## Using Problem-Solving Strategies

- Make a picture.

### Introduction

To solve this problem, students will add and subtract fractions with the same denominator and find a fraction of a whole number. You might want to review the latter idea with an exercise like, "Find  $\frac{2}{3}$  of 12." Remind the students that to draw a picture to represent  $\frac{2}{3}$  of 12, they can draw 3 Xs,

```

X   X   X
X   X   X
X   X   X
X   X   X
  
```

then 3 more in each column, and repeat this until 12 Xs are drawn. This represents 12 divided into 3 groups for the denominator.

Now draw a circle around 2 of the groups to show  $\frac{2}{3}$  of 12, and count the Xs in the circle.  $\frac{2}{3}$  of 12 = 8.

```

X   X   X
X   X   X
X   X   X
X   X   X
  
```

### Using the Page

Read each gasoline gauge with the students. Make sure they understand what fraction of the tank is filled with gasoline.

For Problem 1, ask what fraction of the tank had gasoline at 7:00 A.M. [ $\frac{5}{8}$ ], what fraction had gasoline at 12:00 noon [ $\frac{1}{8}$ ], and what fraction of gasoline in the tank was used [ $\frac{4}{8}$ ]. Students can find the answer to the last question by subtracting  $\frac{1}{8}$  from  $\frac{5}{8}$ , or by counting eighths on the gauge.

Follow the same procedure to answer Problem 2. [ $\frac{3}{8}$ ]

For Problem 3, students should understand that to find the total fraction of a tank of gasoline used, they must add  $\frac{4}{8}$  and  $\frac{3}{8}$ . [ $\frac{7}{8}$ ]

For Problem 4, ask students how many gallons the tank holds. [16] Then have them *draw a picture* to find  $\frac{7}{8}$  of 16. Again, the procedure is to draw Xs in 8 groups until 16 Xs are drawn. Then draw a circle around 7 of the groups, and count the Xs in the circled set.

### Follow-Up

Tell students that Mr. Barrio can drive 28 miles on each gallon of gasoline he uses. Ask how many miles he traveled on this trip. [ $14 \times 28 = 392$ ; 392 miles]

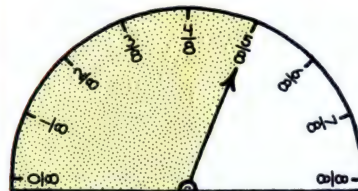
Students may want to try another similar problem.

At 8:00 in the morning, there was  $\frac{7}{8}$  of a tank of gasoline in Mrs. Lawson's car. Between 8:00 A.M. and 12:00 noon

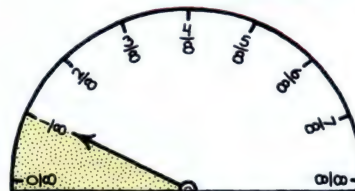
## Using Problem-Solving Strategies

# GASOLINE GAUGE

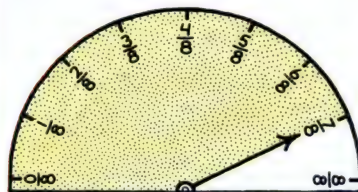
The gasoline tank in Mr. Barrio's car holds 16 gallons. The pictures show the gasoline gauge at various times during a trip. How many gallons of gasoline did Mr. Barrio use on this trip?



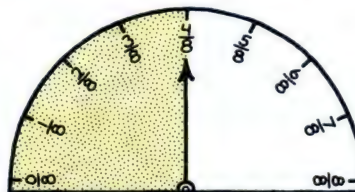
7:00 A.M. (Start of trip)



12:00 noon (Before adding gas)



12:00 noon (After adding gas)



3:30 P.M. (End of trip)

Use the gasoline gauges for Problems 1 and 2.

1. What fraction of a tank of gasoline did Mr. Barrio use from 7:00 A.M. to 12:00 noon?  $\frac{4}{8}$
2. What fraction of a tank did he use from 12 noon to 3:30 P.M.?  $\frac{3}{8}$
3. What fraction of a tank of gasoline did Mr. Barrio use on the entire trip?  $\frac{7}{8}$
4. How many gallons of gasoline did Mr. Barrio use? Draw a picture to help you. **14 gallons**

See margin.

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YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.

#### PROBLEM-SOLVING STRATEGIES

- DRAW A PICTURE
- MAKE A TABLE
- FIND A PATTERN
- USE PHYSICAL MODELS
- USE LOGICAL REASONING
- WORK BACKWARD
- LIST ALL POSSIBILITIES
- TRY AND CHECK
- MAKE A GRAPH



This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

she used  $\frac{5}{8}$  of a tank. What did the gasoline gauge show at 12:00 noon? [ $\frac{2}{8}$ ] She stopped at a gasoline station and put in  $\frac{6}{8}$  of a tank at 12:00 noon. What did the gauge now show? [ $\frac{8}{8}$ , a full tank] She used  $\frac{7}{8}$  of a tank between 12:00 noon and 5:00 P.M. What did the gauge show at 5:00 P.M.? [ $\frac{1}{8}$ ]

#### Answers

4. 

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| X | X | X | X | X | X | X | X | X |
| X | X | X | X | X | X | X | X | X |

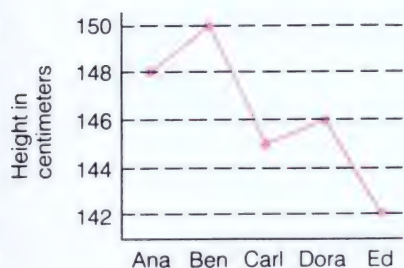
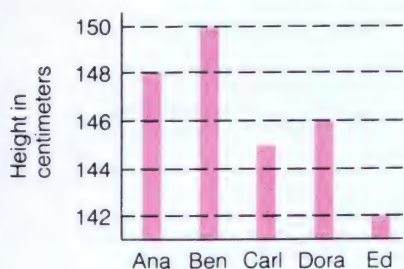
**$\frac{7}{8}$  of 16 is 14. Mr. Barrio used 14 gallons of gasoline on the entire trip.**

Maintenance; Choosing a Computation Method, p. 408



## Mathematical Background

**Basic Concepts in Graphing** A graph is simply a *geometric* representation of *numerical* information. The most important factor in determining which type of graph to use is how well the numerical information can be interpreted from that graph. Suppose Mr. Lopez measures, in centimeters, the heights of five students in his class. He can then record the heights on a bar graph or on a broken-line graph:



A person reading either graph can determine the heights, but mathematically the bar graph is preferable because the heights are separate items. The broken-line graph, on the other hand, suggests that the heights are related.

**Number Pairs** In mathematics, graphs usually describe relationships between two variables, such as the heights and weights of students in a class. Rather than making a list of each student's height and weight, it might be convenient to use a graph with heights on one axis and weights on the other. Each point (geometric) would be a number pair representing a height and a weight (numerical).

It does not matter which axis represents height and which represents weight, but by convention it is assumed that when a number pair is listed, the first number *must be the horizontal reference*, and the second number is the *vertical reference*.

## Contents

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## Pretest for Chapter 12

Available in the *Teacher's Resource File* (as a blackline master), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

**Pretest Chapter 12**

**Guitar Practice Hours**

|       |   |
|-------|---|
| John  | 3 |
| Lisa  | 4 |
| Kevin | 3 |

Each  $\frac{1}{2}$  means 1 hour.

- How many hours did Kevin practice? 3 hours
- Who practiced the most hours? Lisa
- Who practiced the fewest hours? John

**Favorite Exercise**

|          |   |
|----------|---|
| Swimming | 4 |
| Tennis   | 3 |
| Running  | 4 |

Number of people

- How many people chose tennis as their favorite exercise? 3 people
- Which exercise did 4 people choose as their favorite? Running
- Which exercise was chosen by the most people? Swimming

**Sunny Days Each Month**

|        |   |
|--------|---|
| May    | 3 |
| June   | 4 |
| July   | 5 |
| August | 6 |

Number of days

- How many sunny days were in July? 9 days
- Which month had 6 sunny days? June
- Which month had 3 sunny days? May

23

Name \_\_\_\_\_

**Pretest Chapter 12 continued**

**Points on a Grid**

|   |   |   |
|---|---|---|
| W | J | E |
| G |   | F |
|   | I |   |

10. Which letter names the point located by (2, 3)? J

11. Which letter names the point located by (4, 1)? I

Which number pair gives the location of each point?

12. H (1, 4)

13. F (4, 3)

14. G (1, 2)

Number a grid. Then graph and label the points located by the number pairs given.

15. R (2, 3)

16. S (4, 3)

17. T (3, 1)

18. U (4, 5)

**Cost of Tickets**

|                   |        |
|-------------------|--------|
| Number of tickets | Cost   |
| 1                 | \$2.00 |
| 2                 | \$4.00 |
| 3                 | \$6.00 |
| 4                 | \$8.00 |

19. What is the cost of 4 tickets? \$8.00

20. Linn bought 2 tickets. How much change did she get from \$5.00? \$1.00

24



# Teaching Chapter 12



## Problem Solving

**Five-Step Method** Throughout the text, students solve problems using data from pictures, tables, price tags, maps, and so on. In this chapter, the focus in the READ step is on using information from graphs. Reading graphs is an important skill, useful not only for problem solving in math books but also for problem solving in real life.

**Problem-Solving Strategies** By the time students solve the nonroutine problems in the *Using Problem-Solving Strategies* feature in this and previous chapters, they will have used all of the following problem-solving strategies: *Find a pattern, Make a table, Try and check, Draw a picture, List all possibilities, Work backward, Use logical reasoning, Solve a simpler problem, Use physical models, Draw a diagram, and Make a graph.*

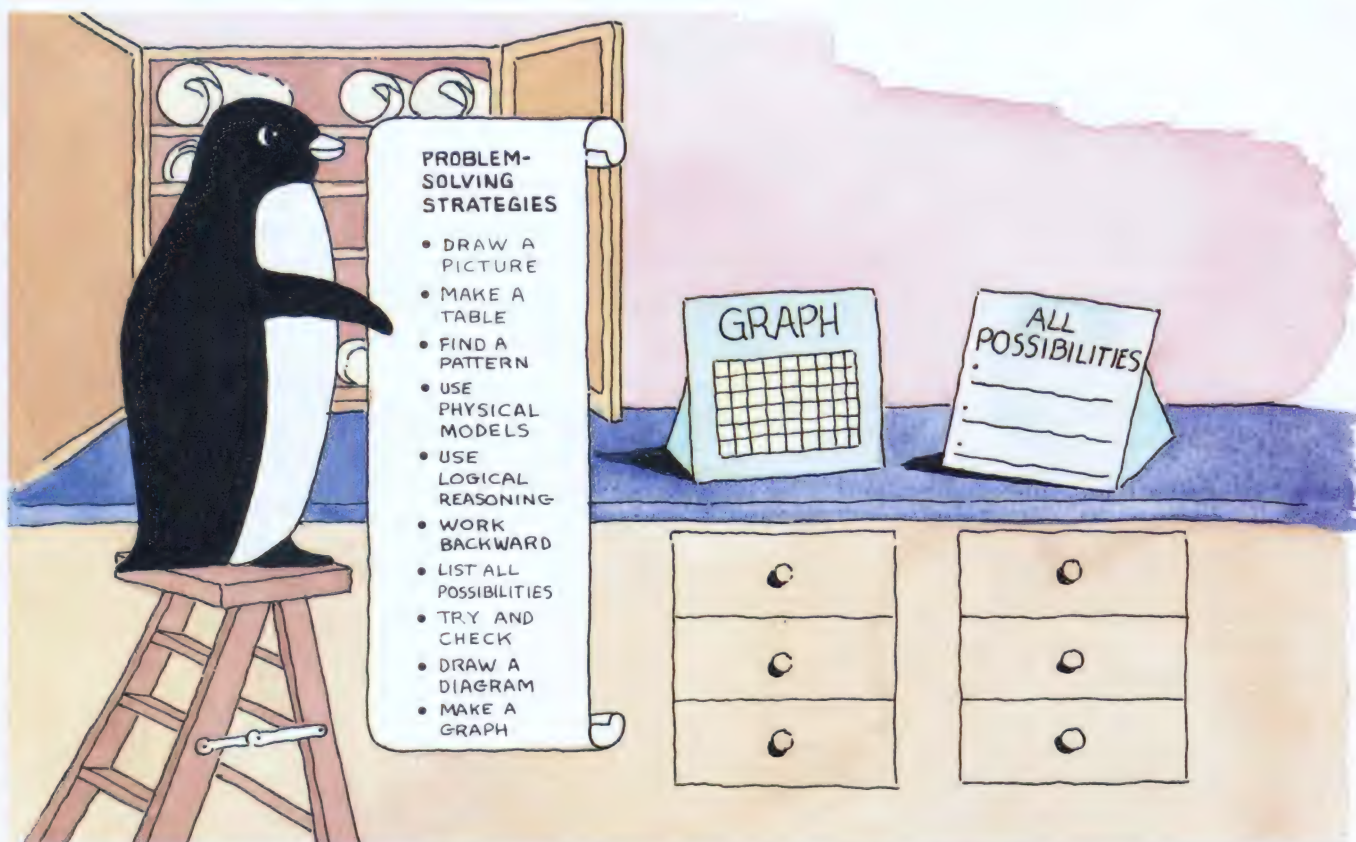
Problem solving in this chapter lends itself nicely to the idea of a problem-solving bulletin board discussed on page 22B. This time, you might want to post a graph on Monday, and pose one or more problems for students to solve over the course of the week.



## Calculators and Computers

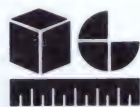
**Calculators** If students have a constant function on their calculators, suggest that they use it to find the costs in **Additional Resource 127**.

**Computers** This chapter introduces the LET statement. In a LET statement, a variable is assigned a memory location, and its value is stored there. "LET  $N = 1$ ," means that the value 1 is stored in a memory location called  $N$ . Whenever  $N$  is used later in the program—as in  $\text{PRINT } N + 2$ —the value 1 is taken out of the memory and used for  $N$ . **Additional Resource 125** gives students a chance to see what they have learned thus far, combined into programs that have LET, INPUT, and GOTO statements.



By the time students complete Chapter 12, they will have studied and practiced all the strategies on the list.





## Concrete Materials

In Problem 12 on page 335, students are asked to collect their own data and make a corresponding graph. You might want to have a list of topics available. Or you might want to have the data organized for the class before they are ready to begin, so that students can concentrate on the drawing and labeling of the graph.

Encourage students to find various types of graphs in newspapers and magazines. You may want them to make a bulletin-board display with these graphs.

In order to have a hands-on experience with coordinate grids, students might use geoboards or pegboards with string. After putting the board on paper so that the lines can be numbered, students can construct designs and then write the ordered pairs. Then classmates can reproduce the design.



Students will understand graphs better if they have firsthand experiences making graphs. Their graphs will be more meaningful and easier to do if they collect the data themselves.



## Teaching Techniques

**Questioning and Responding** When teaching graphing, you have an excellent opportunity to ask questions that encourage students to experiment and explore. You can ask students to graph data that they gather themselves. This will get them involved and will help them think through on their own all the decisions that go into making a graph.

After a student answers a question, it is a good idea to sometimes ask the rest of the class or another student for a reaction, instead of saying "that's right" or "that's wrong." The other students will then have to think about the question and answer, and they will be encouraged to listen to each other, instead of always listening just to the teacher.

**Helping Students Read and Write Mathematics** If students have trouble reading coordinate graphs, it may help them if they will put their finger at the origin and move their finger along the grid lines. When students make graphs, remind them to allow ample room on their paper and tell them to be sure to label everything carefully.

**Teaching Students with Special Needs** A good project for gifted students is to have them obtain data from the weather bureau or newspaper clippings about temperature and precipitation for your city, Minneapolis, Los Angeles, New York, Nassau, London, Cairo, Melbourne, and Tokyo. They can make graphs to compare the weather in different cities month by month. Ask students which cities have similar weather patterns. Also, ask what factors beside latitude can affect the weather.

**Relating Mathematics to Other Subjects** The following lesson in this chapter has a theme that relates mathematics to other school subjects.

Science: constellations (342–343)



## Thinking Skills

This chapter emphasizes following rules and procedures for reading and making graphs. Problem 15 on page 333 presents an interesting puzzle that encourages students to **analyze relationships** as they systematically *try and check*. The Situational Lesson on page 331 reinforces higher order thinking skills by requiring students to make decisions and formulate problems.



## Bulletin Board Suggestions

The posters shown here can be used with Chapter 12. For additional suggestions on uses of these posters, see *Answer Key and Notes for Teacher's Resource File*.



Math Poster QQ



Math Poster RR

## Materials Chapter 12

- Paper for pictographs 332–333
- Stickers 332–333
- Rulers 334–335, 342–343
- Colored paper (1" × 8" strips) 334–335
- Paper for bar graphs 334–335
- Construction paper 336–337
- Geoboards and string 336–337
- Sets of cards (5, 10, 15, 20, 25) 336–337
- Coordinate grids (Teaching Aid L) 336–337, 340–345
- Two coins for every pair of students 338–339
- Road maps 340–341
- Overhead projector 342–343



## Situational Lesson

## Basic Situation

Use the picture on this page to begin a discussion of graphs. Ask students to suggest what might be represented by the graph in this picture. For a particular suggestion, for instance, the favorite colors of fourteen students, ask questions such as: How many students like red best? How many more students like yellow than blue?

Then ask students to conduct a survey and display their data using a graph. You may want students to work in groups of 2 or 3.

## Possible Problems

- What would be a good question for a survey?
- Who would be surveyed?
- How can the data be gathered?
- Which type of graph should be used to display the results?

## Indicators of Success

Give students who attack the problem logically positive reinforcement. Some students may begin by deciding on a topic, possibly by discussing their interests, such as television shows, music, sports, pets, and so on. Then, they may decide who to survey. Finally, they may choose a type of graph to use.

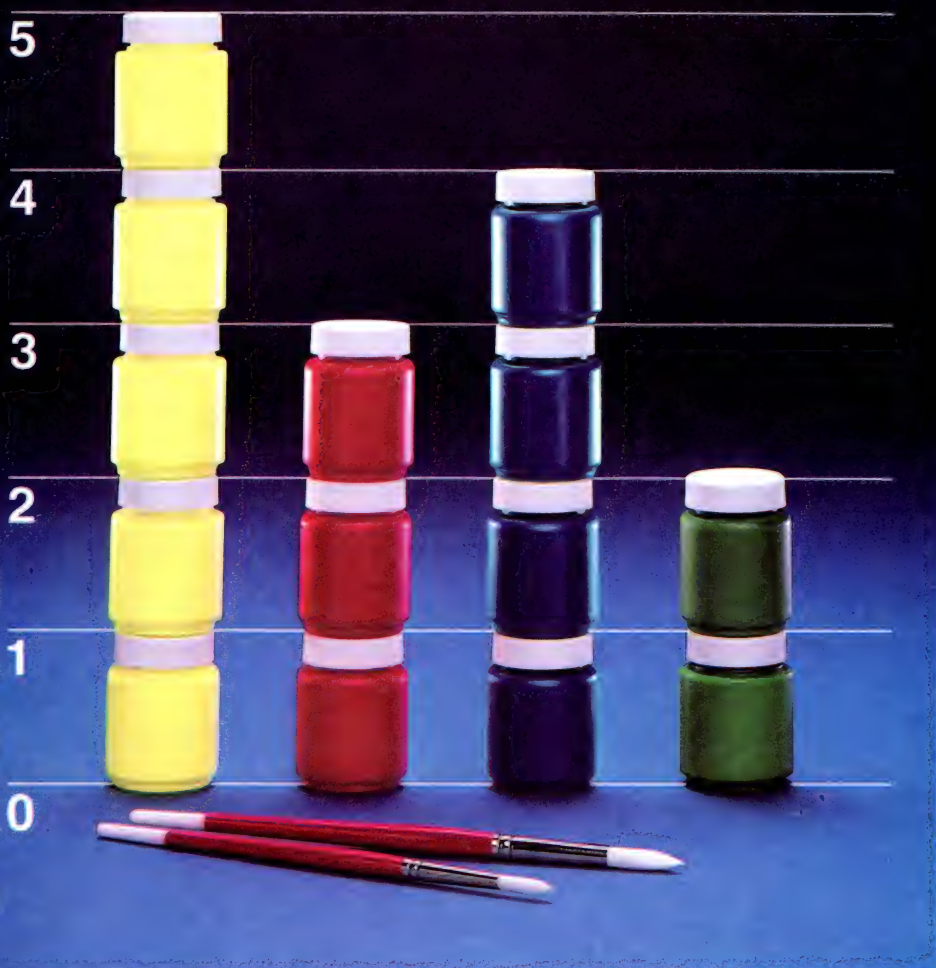
Some students might ask survey respondents to give one favorite sport, pet, or game. Other students might ask respondents to rank in order of preference their three favorite choices in each category.

Students should determine the format of the survey, as well as the type of graph used to display the information.

## Ways to Help

Some students will be able to conduct the survey, but may have difficulty making the graph. You may want to refer them to the lessons on pictographs, pages 332–333; bar graphs, pages 334–335; and broken line graphs, pages 336–337.

It may be helpful to discuss who might be included in the survey, how many people might be included, and other factors which might influence the results of the survey.



In situational lessons, students work with complex, open-ended, problem-solving situations. As students formulate problems, select strategies, and make decisions, they exercise higher-order thinking skills. For more information about situational lessons, see page 463.

## Possible Results

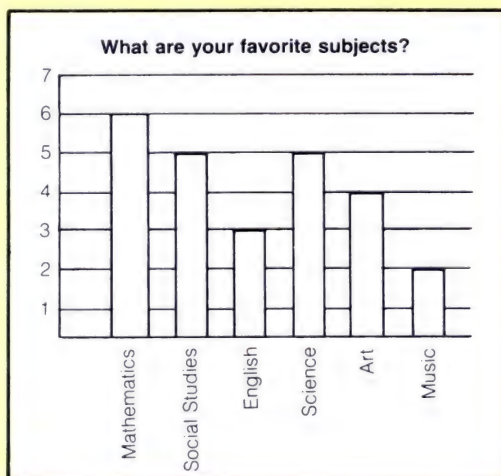
Here is one way that students might conduct a survey and graph the results.

Survey:

What subject do you like best?  
Recess does not count.

Return to Group A.

| Subjects       | Tally | Count |
|----------------|-------|-------|
| Mathematics    | I     | 6     |
| Social Studies |       | 5     |
| English        |       | 3     |
| Science        |       | 5     |
| Art            |       | 4     |
| Music          |       | 2     |





## Objective 123

Read and interpret pictographs.

### Lesson Theme

School Activities: Clubs

### Vocabulary

Pictograph

### Materials

- Paper for pictographs
- Stickers

## Introduction

**Using Concrete Materials** Tell the students they are going to make a pictograph showing the number of students in the class who have red hair, the number who have brown hair, and the number who have blonde hair. Help them gather the pertinent data and list it on the chalkboard. As you construct the pictograph on the chalkboard, have students set up the graph on their paper. Let them use a gummed sticker or draw a circle to represent each student. A sample pictograph is shown.

|             |                     |
|-------------|---------------------|
| Red hair    | ● ● ● ●             |
| Brown hair  | ● ● ● ● ● ● ● ● ● ● |
| Blonde hair | ● ● ● ● ● ● ● ●     |

Each ● means 1 student.

Bring several pictographs to class and display them on the bulletin board. Help students read some of the selected pictographs.

## Using the Pages

**Teach** In the example, be sure students understand that each symbol in the pictograph represents 3 students.

**Try** Work these exercises orally with the entire class. Encourage students to count by 3s to find the answers to Exercises a and b. Point out that students can answer both Exercises c and d, however, simply by comparing the number of symbols for each club.

**Practice** Be sure students realize that each bicycle represents 2 students.

**Apply Problem Solving** Problem 14 requires students to use a fraction of a symbol to represent one student.

**Make a graph** Have students make a pictograph to show the ages of the members of their families. Discuss what symbols could be used [Clocks or faces and so on] and for how many years each symbol could stand. You may wish to provide paper which has already been ruled to make a pictograph.

(Continued on page 333.)

## Pictographs

This *pictograph* shows the number of students at Harris School who belong to each club.

Number of Students in Clubs



- A.** How many students at Harris School belong to the computer club?

There are 5 after computer club; each means 3 students.

15 students belong to the computer club.

- B.** Which club at Harris School has the fewest students?

There is only 1 after swimming club. The other clubs have more.

The swimming club has the fewest students.

**Try** Use the pictograph above to find each answer.

- a.** How many students belong to the reading club?

**18 students**

- c.** Does the computer club or the reading club have more members?

**Reading club**

- b.** How many students belong to the art club?

**6 students**

- d.** Which club has the greatest number of students?

**Bicycle club**

332

## Practice 123

Name \_\_\_\_\_ P123

The students in Mr. May's classes voted for their favorite summer and winter sports.

This pictograph shows the results for summer sports.

Which sport got the

| Favorite Summer Sports | Symbols |
|------------------------|---------|
| Swimming               |         |
| Tennis                 |         |
| Baseball               |         |
| Bike riding            |         |
| Roller skating         |         |
| Fishing                |         |

Each means 2 votes

How many votes were for

- most votes? **Baseball**
- least votes? **Fishing**
- swimming? **14 votes**
- tennis? **6 votes**

This pictograph shows the results for winter sports.

Which sport got the following number of votes

| Favorite Winter Sports | Symbols |
|------------------------|---------|
| Sledding               |         |
| Ice skating            |         |
| Hockey                 |         |
| Basketball             |         |
| Skiing                 |         |

Each means 3 votes

How many more students voted for basketball than for

- sledding? **12 more**
- hockey? **6 more**
- skiing? **18 more**

## Reteaching 123

Name \_\_\_\_\_ R123

Students at the Hillside School voted for their favorite flower. The pictograph shows the results.

| Flowers    | Symbols |
|------------|---------|
| Roses      |         |
| Mums       |         |
| Orchids    |         |
| Tulips     |         |
| Carnations |         |

Each means 2 votes

How many students voted for roses?

There are 3 after roses. Each means 2 votes.  $3 \times 2 = 6$

6 students voted for roses.

How many voted for

- tulips? **8**
- orchids? **2**
- mums? **4**
- carnations? **10**

Which flower received the greatest number of votes? **Carnations**

Which flower received the least number of votes? **Orchids**

The students also voted for their favorite dog.

| Dogs   | Symbols |
|--------|---------|
| Beagle |         |
| Poodle |         |
| Collie |         |

Each means 3 votes

How many students voted for

- beagle? **9**
- collie? **15**
- poodle? **6**

Which dog received the greatest number of votes? **Collie**

Which dog received the least number of votes? **Poodle**

How many students voted? **30**



**Practice** The pictograph below shows the number of students in each grade who are members of the bicycle club at Harris School.

Number of Bicycle Club Members



Each  means 2 students.

How many members of the bicycle club are in

1. first grade? **2**
2. second grade? **4**
3. third grade? **4**
4. fourth grade? **10**
5. fifth grade? **12**
6. sixth grade? **4**
7. Which grade has the most students who belong to the bicycle club?  
**Fifth grade**
8. Which grade has the fewest students who belong to the bicycle club?  
**First grade**
9. Does first grade or fifth grade have more students who belong to the bicycle club?  
**Fifth grade**
10. Which three grades have the same number of students who belong to the bicycle club?  
**Second, third, and sixth grades**

**Apply** Solve each problem.

**Use data from a pictograph.** Use the pictograph above for Problems 11–13.

11. How many fewer members of the bicycle club are from second grade than from fifth grade?  
**8 fewer members**
12. How many more members of the bicycle club are from fifth grade than from sixth grade?  
**8 more members**
13. All of the bicycle-club members who are in the fourth, fifth, and sixth grades went on a field trip. How many members went?  
**26 members**
14. **Thinking Skills** Lorie is making a pictograph. She will use one circle to mean 2 students. How many circles will she use to show 4 students? 1 student? 15 students?  
**2 circles mean 4 students**  
 **$\frac{1}{2}$  circle means 1 student**  
 **$7\frac{1}{2}$  circles mean 15 students**
15. Using each of the digits 0 through 9 once, write two 5-digit numbers that have a sum of 90,000.  
**Answers will vary. 10,648 79,352**

Using Problem-Solving Strategies, page 432  
More Practice Set 123, page 395 **333**

## Assignment Guide

basic 1–10  
average 1–13, 15  
enriched 1–15

**More Practice Set 123,**  
**page 395**

(Continued from page 332.)

**Try and check** For Problem 15, stress that students must use each digit, and use each one only once. Explain that there are several possible combinations of numbers that will make the sum 90,000. In finding the numbers, it would help students to put the numbers in the ones place and the ten-thousands place first, then fill in the numbers in between.

The numbers in the ones place must add up to 10 and the numbers in the ten-thousands place must add up to 8 before renaming. The tens, hundreds, and thousands place must add up to 9 before renaming. The zero cannot be used in the ten-thousands place.

## Follow-Up

**Reteaching Using Concrete Materials**

For students having difficulty with the idea of a symbol or object representing a quantity other than 1, use pictures or diagrams to discuss such examples as 1 badge representing 3 scout achievements or 1 prize representing 2 box-tops.

## Calculator

**Choosing a computation method** Let students choose whether to do each of the following exercises with a calculator, paper and pencil, or mental arithmetic and then give reasons for their choice.

1.  $2,341 + 809 + 76$  [3,226]
2.  $4,007 + 861$  [4,868]
3.  $25 + 30 + 45 + 87$  [187]
4.  $6,502 - 3,749$  [2,753]
5.  $507 - 237$  [270]
6.  $900 - 478$  [422]

## Cooperative Learning Groups

See page 485 of this Teacher's Edition.

## Daily Maintenance

1.  $89 + 32 + 10$  [131]
2.  $60 + 98 + 15$  [173]
3.  $74 + 23 + 41$  [138]
4.  $57 + 12 + 83$  [152]
5.  $21 + 95 + 56$  [172]



























**Using Problem-Solving Strategies, page 432**

## Enrichment 123

Name \_\_\_\_\_ E123

**Lunchtime**

This pictograph shows how many customers ate lunch at 5 restaurants during 1 week.

|                    |   |   |
|--------------------|---|---|
| Bob's Burger Haven |      | Each  means 200 customers served |
| Sizzlin Sally's    |      |   |
| Good Day's         |      |   |
| Burger Quick       |      |   |
| Al's Diner         |      |   |

1. How many customers did Bob's Burger Haven serve?  
**700 customers**
2. How many more customers did Burger Quick serve than Sizzlin Sally's?  
**400 more customers**
3. Good Day's and Burger Quick are both owned by Charlie and Betty Day. How many customers did their 2 restaurants serve?  
**1,900 customers**
4. Which restaurant served more than 1,000 customers? How many were served?  
**Burger Quick**  
**1,400 customers**
5. Sizzlin Sally's makes an average profit of \$0.08 on each customer served. How much profit did they make that week?  
**\$80.00**
6. Al's Diner makes an average profit of \$0.11 on each customer served. How much profit did they make that week?  
**\$88.00**
7. Good Day's earns an average profit of \$0.27 on each customer served; Burger Quick earns \$0.09. Which restaurant earned more that week?  
**Good Day's**

## Additional Resource 123



### Math Poster QQ Pictographs

There were 2 blimps, 6 balloons, 4 gliders, and 12 parachutes at the air show. See Answer Key for extensions and uses with other lessons.



## Objective 124

Read and interpret bar graphs.

### Lesson Theme

School Activities: Computer Class

### Vocabulary

Bar graph

### Materials

- Rulers
- 1" × 8" strips of colored paper
- Paper for bar graphs

## Introduction

**Using Concrete Materials** Have students work in groups of 4 or 5. Give a strip of colored paper, 1" × 8", to each student. In their groups, each member should cut the strip to a different inch length. Each group should also have a paper that has been ruled to allow places for names along the left side and, starting 3 inches from the left, has vertical lines drawn one inch apart. Have students write their names and then paste their strips of paper next to their names. Discuss whose strip is the longest, shortest, and so on.

Explain that a bar graph is another visual representation of data. Ask for examples of bar graphs students have seen. You may want to bring bar graphs from newspapers and magazines to display on the bulletin board alongside the pictographs.

## Using the Pages

**Teach** In the example, point out the titles "Number of students" and "Grade." Emphasize that these two kinds of information are related in the graph. Explain that a bar graph shows variations in data from the minimum to the maximum.

**Try** Discuss these exercises with students.

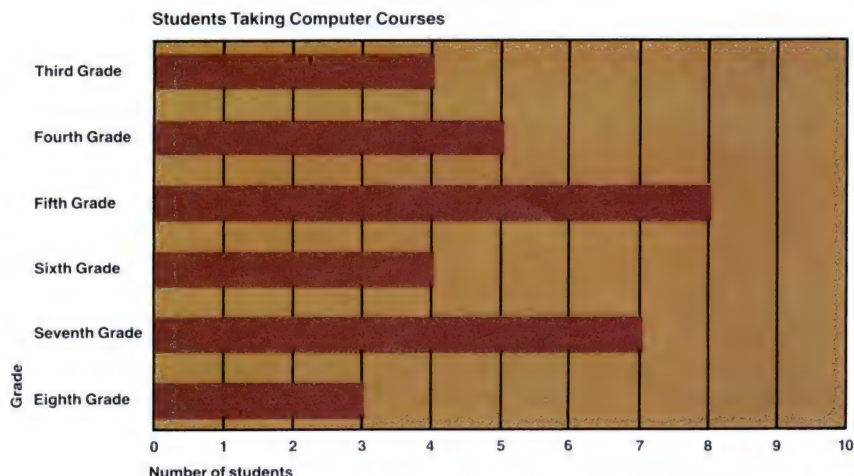
**Practice Error Analysis** Watch for students having difficulty reading the graph because the bars run vertically rather than horizontally, as in the example. Suggest that these students place the book on its side.

**Apply Problem Solving** Helping students see applications of mathematics in their own lives may increase their interest in the subject.

**Write a problem** Using the graphs made in the *Introduction*, ask each group to decide what data the graph could represent and write a problem situation to describe it. (Continued on page 335.)

## Bar Graphs

This *bar graph* shows the number of students in each grade at Fisher School who took a 6-week computer course.



- A.** How many third-grade students took the computer course?

The bar for third grade stops at 4.

4 third-grade students took the course.

- B.** Which grade had the greatest number of students who took the computer course?

The bar for fifth grade stops at 8. For each of the other grades, the bar stops before 8.

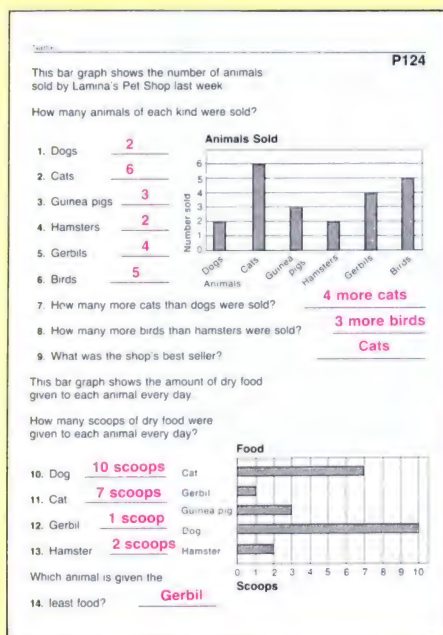
Fifth grade had the most students who took the computer course.

**Try** Use the bar graph above to find each answer.

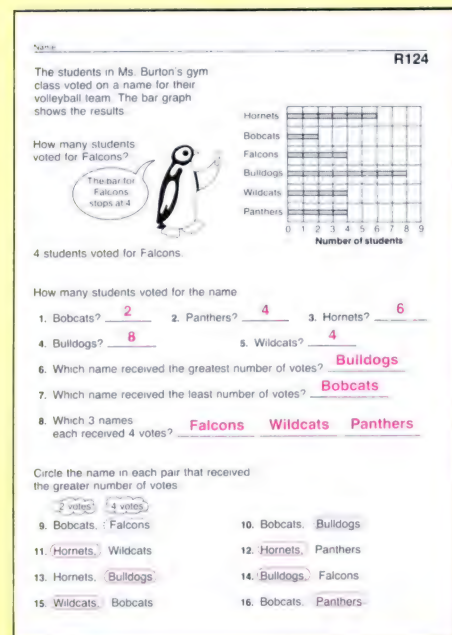
- a.** How many seventh-grade students at Fisher School took the computer course?  
**7 students**
- c.** Which grade has the least number of students who took the computer course?  
**Eighth grade**
- b.** How many sixth-grade students at Fisher School took the 6-week computer course?  
**4 students**
- d.** Does third grade or fourth grade have more students who took the computer course?  
**Fourth grade**

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## Practice 124



## Reteaching 124





## Assignment Guide

basic 1–13  
average 1–13  
enriched 1–13

**More Practice Set 124,**  
**page 396**

(Continued from page 334.)

**Find the facts** You might want to suggest that students working on Problem 12 choose a topic to research that allows each student to gather the information needed to draw one bar of a bar graph. For instance, if students want to find out the number of pupils who walk to school in grades 4, 5, and 6, one student should survey each grade and draw a bar of the bar graph to show the results. Different groups may want to research related topics. For instance, one group may conduct a survey to find favorite TV shows among the class members, while another group would make a graph showing national television ratings. Students might compare graphs on similar topics and try to draw comparisons.

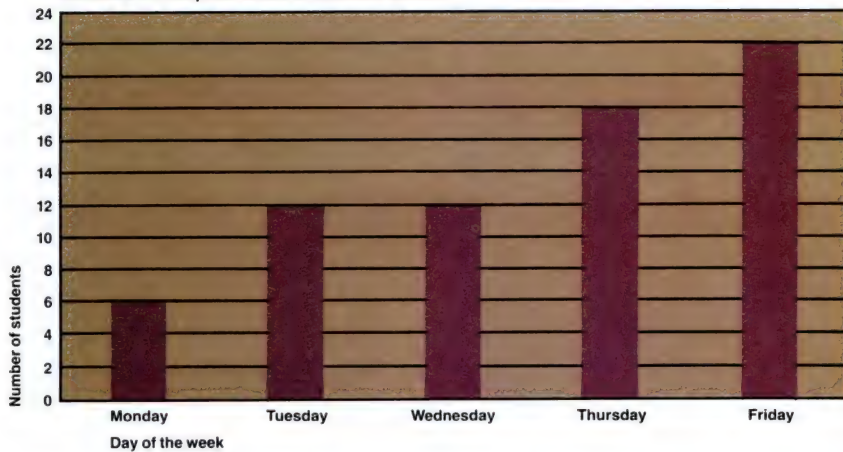
Emphasize the importance of using the same scale for all of the bars on a single graph.

## Follow-Up

**Extra Practice** Have students cut bar graphs from newspapers or magazines and write questions about the graphs. Students could exchange graphs and answer each other's questions.

**Enrichment** Have the students make pictographs from the bar graphs presented on these pages.

Students in Computer Class at Johnson School



**Practice** Use the bar graph above to find each answer.

How many students at Johnson School have computer class on

- Monday? **6**
- Tuesday? **12**
- Wednesday? **12**
- Thursday? **18**
- Friday? **22**

On which day does the class have

- the greatest number of students? **Friday**
- more than 20 students? **Friday**
- the least number of students? **Monday**
- fewer than 10 students? **Monday**

**Apply** Use data from a bar graph. Solve each problem.

- How many more students have computer class on Friday than on Monday? Use the bar graph above. **16 more students**
- What is the total number of students who have computer class? Use the bar graph above. **70 students**
- Find the facts.** Work with 3 other students. Select a topic for which you can make a bar graph. Have your teacher approve your topic. Then collect the data and make a bar graph. Discuss your graph with the class. **See Using the Pages.**
- CALCULATOR** A computer club bought 18 program packages. Each package cost \$34.95. What was the total cost? **\$629.10**

Using Problem-Solving Strategies, page 433  
More Practice Set 124, page 396 **335**

## Enrichment 124

Name \_\_\_\_\_

**Heads and Tails** E124

You will need a penny, a nickel, and a dime for this experiment.

When tossed, each coin will fall either heads or tails. Toss all 3 coins together 48 times. Tally the outcomes in the table.

| Outcome         | Tally |
|-----------------|-------|
| 3 Heads         |       |
| 1 Tail, 2 Heads |       |
| 2 Tails, 1 Head |       |
| 3 Tails         |       |

**Answers will vary.**  
Make a bar graph to show how often each outcome occurs.

## Additional Resource 124

Name \_\_\_\_\_

**Computer BASIC: LET Statements** Additional Resource 124

The **LET** statement tells the computer to give a letter a value and store it in its memory. You can use this number anytime in your program.

The program below shows how LET statements can be used.

```

10 LET A=9
20 LET B=10
30 LET C=11
40 LET D=A+B+C
50 PRINT D
60 END
  
```

Type and run each of these programs. Write the outputs.

|   |   |
|---|---|
| 1. 10 REM USING LET<br>20 LET A=5<br>30 PRINT A+7<br>40 END             | 2. 10 REM ANOTHER LET<br>20 LET B=8<br>30 PRINT B*7<br>40 END         |
| 3. 10 LET X=46<br>20 LET Y=19<br>30 PRINT X-Y<br>40 PRINT X+Y<br>50 END | 4. 10 LET R=9<br>20 LET S=6<br>30 LET T=6<br>40 PRINT R+S+T<br>50 END |

5. 10 PRINT "TYPE A NUMBER."  
 20 INPUT G  
 30 LET H=18  
 40 PRINT "SUM" "PRODUCT"  
 50 PRINT G+H, G\*H  
 60 GOTO 10  
 70 END

| TYPE A NUMBER |         |
|---------------|---------|
| SUM           | PRODUCT |
| 20            | 75      |

TYPE A NUMBER (and so on)

## Daily Maintenance

- $\frac{8}{10} - \frac{2}{10}$  [ $\frac{6}{10}$ ]
- $\frac{3}{4} - \frac{1}{4}$  [ $\frac{2}{4}$ ]
- $\frac{3}{9} - \frac{2}{9}$  [ $\frac{1}{9}$ ]
- $\frac{1}{3} - \frac{0}{3}$  [ $\frac{1}{3}$ ]
- $\frac{5}{5} - \frac{3}{5}$  [ $\frac{2}{5}$ ]

**Using Problem-Solving**  
**Strategies, page 433**



## Objective 125

Read and interpret broken-line graphs.

### Lesson Theme

School Activities: Computer Programs

### Vocabulary

Broken-line graph

### Materials

- Construction paper
- Geoboards and string
- Sets of cards (5, 10, 15, 20, 25)
- Coordinate Grids (Teaching Aid L)

## Introduction

**Using Concrete Materials** Have students work in groups of 4 or 5. Each group places a geoboard on a sheet of construction paper and labels the rows on the left, 5, 10, 15, 20, and 25. Then have the group label the columns along the bottom with the name of each student in the group. The first student draws a card and ties the string on the peg in the left column where his or her name is written, and the row that matches the number that is drawn. The second student listed draws a card and loops the string around the peg where that student's name meets that number. This is repeated until each student has had a turn. Ask what the numbers could represent. [Points in a game, number of mistakes, number of pennies in a bank] Students could repeat the activity by using a new sheet of paper with numbers from 2–10, and by rearranging their names.

Bring several broken-line graphs to class and display them alongside the pictographs and bar graphs on the bulletin board.

## Using the Pages

**Teach** After discussing Examples A and B, ask whether 25 programs were written in the middle of September. [This graph cannot relay that information because on graphs such as this only the points on the vertical lines are significant.]

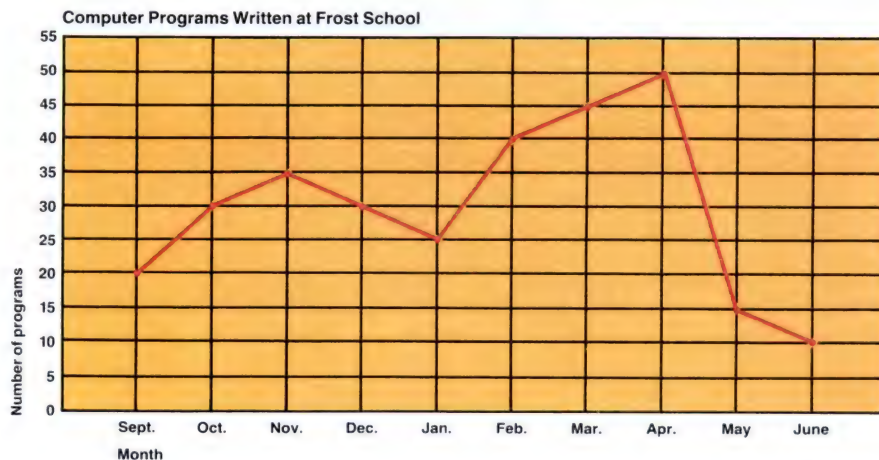
**Apply Problem Solving** These problems involve computation using information read from the graph.

**Make a graph** Have students make a broken-line graph to show the heights of the members of their families.

**Calculator** Suggest that students list the pages on which computer programs are given, the number of programs on each page, and the number of lines in each program. There are 36 programs and 134 lines.

## Broken-Line Graphs

The computer-club teacher at Frost School kept a record of the number of computer programs written by students during the school year. This **broken-line graph** shows the results.



- A.** How many computer programs were written in May?

The months are named at the bottom of the grid. Find *May* and follow the grid line straight up to the graph point. Then follow the grid line straight to the left where the number of programs is shown as 15.

15 programs were written in May.

- B.** In which month were 25 computer programs written?

The numbers of programs are given on the left side of the grid. Find 25 programs and follow the grid line straight to the right where there is a graph point. Then follow the grid line straight down to the bottom where the month is shown as January.

January is the month in which 25 programs were written.

**Try** Use the broken-line graph above to find each answer.

- a.** How many programs were written in September?

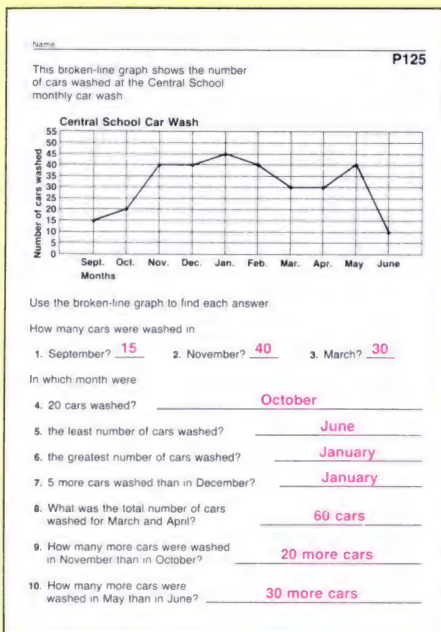
**20 programs**

- b.** In which month were 45 programs written?

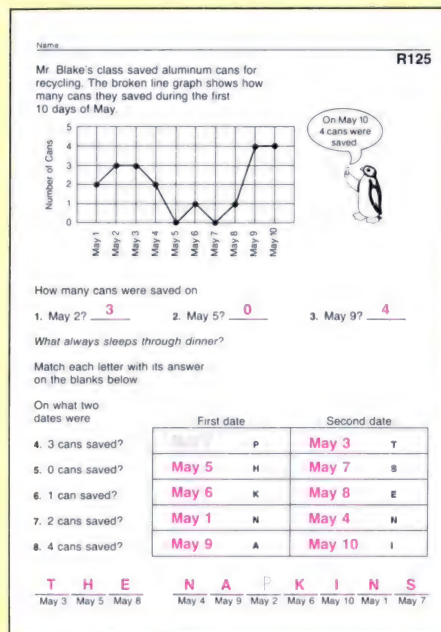
**March**

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## Practice 125



## Reteaching 125





## Assignment Guide

|          |          |
|----------|----------|
| basic    | 1-11     |
| average  | 1-12, 15 |
| enriched | 1-15     |

**More Practice Set 125,  
page 396**

### Computer

Tell the students that the computer automatically assigns a value of 0 to a letter until they change it with the LET statements. That is why they will get a response of 0 if they type PRINT BOB into their microcomputer, without quotation marks around the name BOB. The computer is looking for the value of the letter(s) and cannot find one in its memory, so it prints out 0.

Exercises 3 and 4 show two ways to assign values to letters—INPUT and LET. Discuss the similarities and differences with students.

Remind students to type NEW before each new program if they are going to use the computer for these programs.

### Follow-Up

**Extra Practice Use data from outside the text** Have students bring in broken-line graphs from newspapers or magazines. Use these to make overhead transparencies to show to the whole class. Have the students who brought in the graphs ask the class questions about them.

### Enrichment Use data from outside

**the text** Challenge students to use reference books to find data that could be used in making broken-line graphs. Some students may wish to construct such graphs.

### Reading and Writing Mathematics

Have students use grid paper and the glossary to make a crossword puzzle with mathematics vocabulary words. After students have completed their puzzles, they can exchange them and work each other's puzzles.

### Daily Maintenance

Compare the decimals. Use < or >.

- 3.9 ● 4.0 [<]
- 6.7 ● 6.2 [>]
- 19.38 ● 19.83 [<]
- 536.7 ● 537.6 [<]
- 868.43 ● 865.43 [>]

## COMPUTER

### BASIC: LET Statements

A LET statement puts a number into a storage location until it is used later in the program.

In line 10 of this program, 5 is put into a storage location labeled N. In line 20, 5 is taken out of the storage location and used for N.

This is printed.

```
10 LET N=5
20 PRINT N*9
30 END
```

45

Tell what would be printed for each program.

```
1. 10 LET N=7
   20 PRINT 42/N
   30 END
```

6

```
2. 10 LET X=7
   20 LET Y=9
   30 PRINT X+Y
   40 END
```

16

```
3. 8 is typed for X.
```

```
10 INPUT X
20 LET Y=20
30 PRINT Y-X
40 END
```

?8

12

```
4. 12 is typed for N.
```

```
10 INPUT N
20 LET P=7
30 PRINT N+P;
40 PRINT N-P
50 END
```

?12

19 5

**Practice** Use the broken-line graph on page 336 to find each answer.

How many programs were written in

- October? **30**
- November? **35**
- February? **40**
- March? **45**

In which month were

- 10 programs written? **June**
- 35 programs written? **November**

In which month was

- the greatest number of programs written? **April**
- the least number of programs written? **June**
- the same number of programs written as in October? **December**

Were there any months in which

- exactly 5 programs were written? **No**
- exactly 40 programs were written? **Yes**

**Apply Use data from a broken-line graph.** Solve each problem.

What was the total number of programs written in

- September through December? **115 programs**
- the entire school year? **300 programs**
- What was the average number of programs written in a month? **30 programs**
- CALCULATOR** Find the average number of lines in the programs given in the computer sections of this book. **3.722222 About 4 lines**

More Practice Set 125, page 396

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## Enrichment 125

Name \_\_\_\_\_

In the Good Old Summertime E125

Fred and Jenny had summer jobs. Jenny started her job the first week of vacation. Her starting wage was \$3.30 per hour. She worked 30 hours each week. Fred started his job the third week of vacation. His starting wage was \$2.90 per hour. He worked 25 hours per week.

Hourly wages

Week

- How much did Jenny earn for her first week on the job? **\$99.00**
- After 4 weeks, Jenny's hourly wage was raised \$0.20 per hour. What was her new hourly wage? **\$3.50**
- How much did Jenny earn the 7th week of summer vacation? **\$105.00**
- Jenny had no more raises during the summer. What was the total amount she earned for the first 10 weeks? **\$1,026.00**
- After 4 weeks Fred's hourly wage was raised to \$3.20. 4 weeks later he received another raise to an hourly wage of \$3.60. Complete the above graph of Fred's wages for the summer. **\$90.00**
- What did Fred earn the 11th week of summer? **\$90.00**
- Fred and Jenny both quit their jobs at the end of the 16th week. How much did each of them earn during the summer?  
Jenny **\$1,656.00**  
Fred **\$1,150.00**

## Additional Resource 125

Name \_\_\_\_\_

Computer BASIC: More LET Statements Additional Resource 125

You can use LET to state equations that are not often used in math. Consider this equation:  $LET X = X + 1$ .

This statement lets you add 1 to an old value of X. Then X is given the new value. You can use LET with GOTO to write a counting program like the one at the right. Type and run the program.

Type each program. Show the output.

```
1. 10 PRINT "ENTER YOUR AGE"
   20 INPUT A
   30 LET A=A+10
   40 PRINT "IN TEN YEARS"
   50 PRINT "I WILL BE"
   60 PRINT A: " YEARS OLD"
   70 END
```

ENTER YOUR AGE  
?(A)  
IN TEN YEARS  
I WILL BE  
(A+10) YEARS OLD

```
2. 10 REM MULTIPLES OF 5 LOOP
   20 PRINT "ENTER A NUMBER"
   30 INPUT N
   40 LET N=N*5
   50 LET N=N+1
   60 GOTO 40
   70 END
```

ENTER A NUMBER  
?(N)  
(N)\*5=(N\*5)  
(N+1)\*5=((N+1)\*5)  
(N\*2)\*5=((N\*2)\*5)  
(and so on)

```
3. 10 LET C=7
   20 LET D=10
   30 LET E=16
   40 PRINT "7*10*16=";
   50 PRINT C*D*E
   60 END
```

7\*10\*16=1120



## Using Problem-Solving Strategies

- Use physical models.
- Solve a simpler problem.

### Materials

- Two coins for each pair of students

### Introduction

Students perform an experiment with two coins. They use the average for 100 tosses to predict the number of times that both coins will fall heads for 1,000 tosses.

### Using the Pages

Have each pair of students use coins that are alike.

For Problem 1, students may think that when two coins are tossed the three possible outcomes are equally likely. Consequently, they may predict that out of 1,000 tosses, the coins will fall heads approximately 333 times. Through experimentation they should find that this is not the case.

For Problem 2, students work together in pairs and toss two coins 10 times. They record the number of times that both coins fall heads, both coins fall tails, and one coin falls heads and the other coin falls tails. After this has been done, record the results of 10 pairs of students on the board for Problem 3. Record the number of times the two coins have fallen heads.

For Problem 4, have students record the results from the rest of the class and use these results with some of the first set, if necessary, to obtain the combined results of a second set of 100 tosses. Compare this with the first set of 100 tosses (Problem 3).

For Problems 5–7, students should decide to add the least number of two-headed tosses and the greatest number of two-headed tosses, and divide by 2 to find the average number of two-headed tosses for the class. This average should be approximately one fourth of the total number of tosses or 25 tosses (Problem 8).

For Problem 11, students should decide that the number of times that both coins would fall heads when the coins are tossed 1,000 times is 10 times the number of times the coins fall heads when the coins are tossed 100 times. To help students come to this realization, ask questions like the following:

1. If you were actually going to toss two coins 100 times, how many times would you expect both coins to fall heads? [About 25 times or  $\frac{1}{4}$  of the time]

(Continued on page 339.)

## Using Problem-Solving Strategies

# THE COIN EXPERIMENT

When two coins are tossed, one of three possibilities will occur. Both coins will fall heads; both coins will fall tails; or one coin will fall heads and the other coin will fall tails.

1. If you toss two coins 1,000 times, how many times would you expect both coins to fall heads? Write your prediction and give reasons for your guess.

**Answers will vary.**



Perform an experiment with two coins. Work with a partner. One of you tosses the two coins while the other records the result.

Tossing two coins 1,000 times would take a long time. So, consider the results of tossing two coins 100 times. You might divide the work between you and your partner. But you could also just toss two coins 10 times and combine your results with the results of 9 other pairs of students. Then all of you will have the results for 100 tosses.

2. Toss two coins 10 times and record the results. How many times did both coins fall heads?

**Answers will vary.**



## Assignment Guide

|          |      |
|----------|------|
| basic    | 1–11 |
| average  | 1–11 |
| enriched | 1–11 |

**Homework to do with others** Give students the following assignment: Find the three-digit number whose hundreds digit is equal to the tens digit plus the ones digit. The ones digit is equal to the tens digit plus three. The tens digit is two. [725]. Have each student ask another person to help him or her solve the problem and together write one or more similar problems. Ask students to share their problems with the class

(Continued from page 338.)

- If you were to toss two coins 200 times, how many times would you expect both coins to fall heads? Explain your answer. [About 50 times.  $\frac{1}{4}$  of 200 is 50.]
- If you tossed two coins 500 times, how many times would you expect both coins to fall heads? Why? [About 125 times.  $\frac{1}{4}$  of 500 is 125.]

## Follow-Up

Students recorded not only the number of two-headed tosses, but also the number of two-tailed tosses and the number of tosses with one head and one tail. Combine each of these results for the entire class, and compare them to the results for two-headed tosses. Students should notice that the numbers of two-headed tosses and two-tailed tosses are approximately the same. Also, the number of tosses with one head and one tail is approximately twice the number of two-headed tosses.

Some students may want to investigate why the above results would normally happen. Have these students conduct a similar experiment using two different coins, for example, a penny and a dime. The results could then be recorded as 2 heads; penny head and dime tail; penny tail and dime head; and 2 tails. Students should find that each of these outcomes is equally likely. Out of 100 tosses, each should occur approximately 25 times.

## Daily Maintenance

**Choosing a computation method** Have students choose whether to do each exercise mentally or with paper and pencil.

- $7.8 + 3.1$  [10.9]
- $16.6 + 8.4$  [25.0]
- $52.1 + 15.6$  [67.7]
- $7.83 + 6.29$  [14.12]
- $17.59 + 32.67$  [50.26]

Now combine your results with those of 9 other pairs of students. This will give you the results for 100 tosses.

- How many times out of 100 tosses did both coins fall heads?

**Answers will vary.**

- Would you get the same answer to Problem 3 if you used the results of a different group of 10 pairs of students?

**No, not necessarily.**

Perform the experiment again. This time make a list of the results for each of the 10 pairs of students.

- Find out which pair of students has the least number of tosses in which both coins fall heads. What is the least number of times that both coins fall heads?

**Answers will vary.**

- What is the greatest number of times that a pair of students tossed two coins that both fell heads?

**Answers will vary.**

- What is the average of the least number and greatest number of tosses in which both coins fall heads?

**Answers will vary.**

- About what fraction of all the tosses is the average number of tosses in which both coins fall heads?

**About  $\frac{1}{4}$**

- Look at your answer to Problem 3. What fraction of the tosses did both coins fall heads?

**Answers will vary.**

- If you were to perform the experiment again, about how many times out of 100 tosses would you expect both coins to fall heads? tails? one head and one tail?

**About 25 times; about 25 times; about 50 times**

- Use the average to predict the number of times that both coins will fall heads when the coins are tossed 1,000 times. Explain how you used the average to get your prediction. **About 250 times**

**Multiply the average for 100 tosses by 10.**





## Objective 126

Identify number pairs for points on a grid and identify points on a grid for number pairs.

### Vocabulary

Number pair

### Materials

- Coordinate Grids (Teaching Aid L)
- Road maps

## Introduction

**Using Concrete Materials** Display a road map of your state. Have small groups of students join you at the map, and demonstrate that your town can be located in an area using a letter and number such as F-6. Have students locate various areas on the map using references that you give, and give references for locations that you point out.

## Using the Pages

**Teach** If the introductory activity is carried out, then very few students should find it difficult to locate points on the grid as presented in the lesson.

Discuss the examples with the students. Stress that any point can be located on the grid by using a number pair.

**Try** Remind students to move to the right the number of units indicated by the first number and then move up the number of units indicated by the second number.

**Practice Error Analysis** Watch for students who do not move to the right first. Have them state the process in their own words. (See Reteaching 126.)

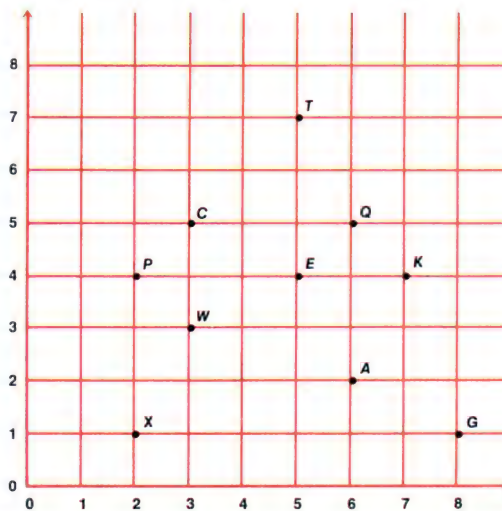
**Apply Problem Solving** Ask students to restate each problem in their own words.

**Error Analysis** Watch for students who misspell an answer. They should check their work.

**Use data from a graph** For Problem 15, students may wish to make up a riddle to go with the word they are using. Encourage them to spell other words in the same manner.

## Points on a Grid

A *number pair* like (3, 5) tells where a point is located on a grid.

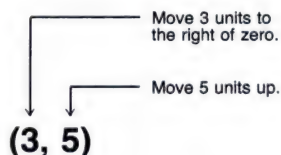


- a. Which letter names the point located by the number pair (3, 5)?

- b. What number pair gives the location of the point named by the letter T?

T is 5 units to the right of 0, and 7 units up from 0.

The number pair (5, 7) gives the location of point T.



The letter C names the point located by the number pair (3, 5).

### Try

- a. Which letter names the point located by the number pair (7, 4)?

K

- b. What number pair gives the location of the point named by the letter P?

(2, 4)

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## Practice 126

Name \_\_\_\_\_ P126

Write the number pair for each point

1. T (0, 12)
2. K (11, 6)
3. M (1, 6)
4. S (12, 4)
5. O (3, 11)
6. A (9, 12)
7. B (8, 8)
8. W (3, 13)

To find the names of four states, write the letter located at each point

9. Pine Tree State: M (1, 6), A (9, 12), I (7, 11), N (5, 9), E (8, 3)
10. Lone Star State: T (0, 12), E (8, 3), X (11, 10), A (9, 12), S (12, 4)
11. Buckeye State: O (3, 11), H (1, 9), I (7, 11), O (8, 5)
12. Gem State: I (12, 1), D (13, 9), A (9, 12), H (1, 9), O (4, 11)

## Reteaching 126

Name \_\_\_\_\_ R126

Which letter names the point located by the number pair (3, 2)?

Start at 0. Move 3 units to the right. Then move up 2 units. The letter T names the point.

What has 18 legs, is covered with spots, and catches flies?

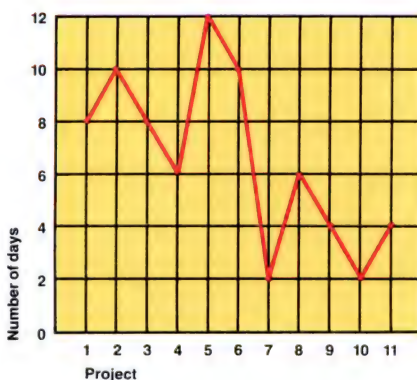
Use the grid above to match each letter with its number pair shown below. A letter may be used more than once.

|          |          |           |           |           |           |           |          |
|----------|----------|-----------|-----------|-----------|-----------|-----------|----------|
| A (4, 6) | B (5, 2) | A (4, 6)  | S (12, 4) | E (8, 3)  | B (5, 2)  | A (4, 6)  | L (4, 0) |
| T (3, 2) | E (8, 3) | A (9, 12) | W (3, 13) | I (7, 11) | H (1, 9)  | T (0, 12) | H (1, 9) |
| A (4, 6) | C (1, 5) | A (9, 12) | E (8, 3)  | O (3, 11) | F (6, 4)  |           |          |
| M (1, 6) | E (8, 3) | S (12, 4) | L (4, 1)  | I (7, 11) | S (12, 4) |           |          |



## CALCULATOR

Rick's teacher gave 7 extra points if a student finished a project in 4 days or less. The teacher also subtracted 5 points if a student took 8 days or more to finish a project. The broken-line graph below shows Rick's work for one month.



1. How many times did Rick receive extra points?  
**4 times**
2. How many extra points did he receive?  
**28 points**
3. How many times did Rick lose points?  
**5 times**
4. How many points did he lose?  
**25 points**
5. How many total points did Rick gain or lose?  
**3 points gained**

## Assignment Guide

basic 1–12, 15  
average 1–15  
enriched 1–15

**More Practice Set 126, page 397**

### Calculator, page 341

Remind the students that this is a broken-line graph.

### Follow-Up

**Extra Practice** Make up 4 grids similar to those on pages 340 and 341. Then have students locate points or give number pairs for stated letters, using the grids.

### Reteaching

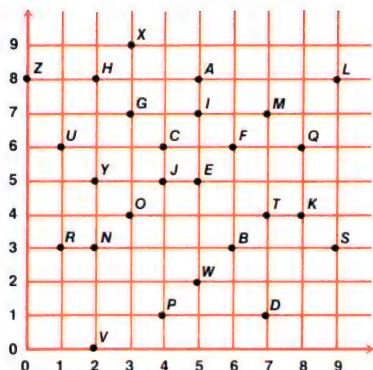
Give students a coordinate graph on which you have located and labeled the following points: A (1, 2), B (1, 3), C (1, 4), D (1, 5), E (2, 1), F (3, 1), G (4, 1), H (5, 1). Discuss why A–D are arranged along the first column [The first number of the pair is 1.] and E–H are arranged along the first row. [The second number of the pair is 1.] Repeat, with A–D beginning with 2, and E–H ending with 2.

### Enrichment

Have students make up secret-message puzzles using coordinate grids, with points labeled with appropriate letters. Students can exchange the puzzles with classmates and solve them.

### Reading and Writing Mathematics

Have students use these words correctly in sentences: average, number pair, grid.



**Practice** Write the letter that names the point located by each number pair.

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 1. (7, 4)<br><b>T</b> | 2. (9, 3)<br><b>S</b> | 3. (2, 8)<br><b>H</b> |
| 4. (1, 6)<br><b>U</b> | 5. (5, 5)<br><b>E</b> | 6. (3, 9)<br><b>X</b> |

Write the number pair that gives the location named by each letter.

- |                        |                        |                        |
|------------------------|------------------------|------------------------|
| 7. M<br><b>(7, 7)</b>  | 8. R<br><b>(1, 3)</b>  | 9. D<br><b>(7, 1)</b>  |
| 10. W<br><b>(5, 2)</b> | 11. Q<br><b>(8, 6)</b> | 12. B<br><b>(6, 3)</b> |

**Apply** To find each answer, write the letter that names each point.

13. What state is high in the middle?  
**O H I O**
14. Spell hard water in 3 letters.  
**I C E**
15. **Write a problem.** Write a question that can be answered with a word. Then write the ordered pairs for each letter in the word.  
**Answers may vary.**

More Practice Set 126, page 397

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## Enrichment 126

E126

**Flow Charts V**

This flow chart shows how to find the second number in the following number pairs.

```

    graph LR
      A[Multiply the first number by 2] --> B[Subtract 1]
      B --> C((2nd number))
  
```

- Complete the table.

| Point | 1st number | 2nd number |
|-------|------------|------------|
| A     | 1          |            |
| B     | 2          | 3          |
| C     | 3          | 5          |
| D     | 4          | 7          |

2. Graph the points from table 1 and connect them in order.

Use this flow chart to find the second number for these number pairs.

```

    graph LR
      A[Multiply the 1st number by itself] --> B[Subtract the 1st number]
      B --> C((2nd number))
  
```

- Complete the table.

| Point | 1st number | 2nd number |
|-------|------------|------------|
| V     | 0          | 0          |
| W     | 1          | 0          |
| X     | 2          | 2          |
| Y     | 3          | 6          |

4. Graph the points from table 2 and connect them in order.

## Additional Resource 126



### Math Poster RR Points on a Grid

The solution to the riddle is as follows:  
EACH PLAYER RAISES A RACKET.  
See Answer Key for an extension activity.

### Daily Maintenance

1.  $3/5 + 1/5$  [4/5]
2.  $3/7 + 2/7$  [5/7]
3.  $1/8 + 6/8$  [7/8]
4.  $1/3 + 1/3$  [2/3]
5.  $3/6 + 3/6$  [6/6]



## Objective 127

Locate points for ordered pairs.

### Lesson Theme

Science: Constellations

### Materials

- Coordinate Grids (Teaching Aid L)
- Overhead projector
- Rulers

## Introduction

**Using Concrete Materials** Give each student a grid on which you have located and labeled the following points:

A (1, 8), B (2, 6), C (4, 4), D (7, 3), E (10, 3), F (10, 1), and G (6, 1). Have each student connect the points in alphabetical order and connect G to D. Then ask the students what the picture looks like. After some discussion, explain that it represents the constellation called the *Little Bear* or the *Little Dipper*. Ask what a constellation is. [A group of stars usually having a recognizable shape] Inquire if students know the names of any constellations, and how they got those names. [People long ago thought that those groups of stars looked like the animals or people for whom they were named.] Tell students the points on the grid represent the stars in the constellation.

## Using the Pages

**Teach** Discuss the example. Use an overhead projector to demonstrate how to locate (1, 3). Have students do this on a worksheet showing a coordinate grid. Work through the entire example using the projector while students create an identical picture on their grids.

**Try** Be sure the students connect only the points specified in the directions.

**Practice Error Analysis** Watch for students whose graphs do not show a five-pointed star and have them check their work. Let students who continue to have difficulty use **Reteaching 127**.

**Apply Problem Solving** The constellation called *The Dragon* is located in the sky near the *Little Dipper*.

**Make a graph** If students wish to graph a constellation, point out that the graph may not be an exact replica of the picture. Students should lay grid paper over the picture and locate each point as close as possible to a place where the grid lines meet.

Answers, pages 342–343

See page 350 of this Teacher's Edition.

## Graphing Number Pairs

Alicia made a picture of the constellation, *Big Dipper*, by graphing number pairs.

She numbered a grid, and used the following number pairs. She located the points, labeled them, and connected them in order.

**A (1, 3)**

**C (3, 5)**

Connect A and C.

**E (5, 5)**

Connect C and E.

**G (7, 5)**

Connect E and G.

**I (8, 4)**

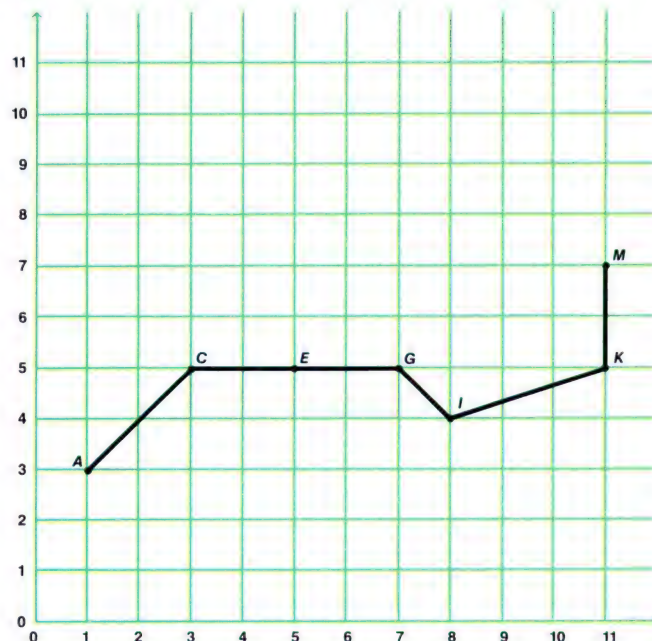
Connect G and I.

**K (11, 5)**

Connect I and K.

**M (11, 7)**

Connect K and M.



**Try** Number a grid. Then graph and label the points located by the number pairs given. Connect the points as directed, to make a letter of the alphabet. **See margin.**

a. B (1, 5)

b. D (5, 5)

c. E (3, 5)

d. G (3, 1)

Connect B and D.

Connect E and G.

342

## Practice 127

Name \_\_\_\_\_

What has to be broken before you can use it?

To find out, first graph and label each point in Exercises 1–20. Connect the points in alphabetical order. Next, locate and connect the pairs of points given in Exercises 21–34.

1. A (9, 1)
2. B (13, 1)
3. C (16, 2)
4. D (18, 4)
5. E (19, 6)
6. F (19, 8)
7. G (19, 10)
8. H (18, 12)
9. I (16, 14)
10. J (13, 15)
11. K (9, 15)
12. L (6, 14)
13. M (4, 13)
14. N (2, 11)
15. O (1, 9)
16. P (1, 8)
17. Q (2, 5)
18. R (4, 3)
19. S (6, 2)
20. T (9, 1)
21. U (9, 6) and (12, 6)
22. V (16, 6) and (16, 8)
23. W (5, 6) and (5, 10)
24. X (13, 6) and (16, 6)
25. Y (9, 10) and (12, 10)
26. Z (5, 10) and (8, 10)
27. AA (5, 6) and (8, 6)
28. AB (9, 10) and (9, 6)
29. AC (12, 8) and (12, 6)
30. AD (11, 8) and (12, 8)
31. AE (13, 10) and (16, 10)
32. AF (13, 6) and (13, 10)
33. AG (5, 8) and (7, 8)
34. AH (15, 8) and (16, 8)

## Reteaching 127

Name \_\_\_\_\_

Use the grid below to both locate and label each point. Connect the number pairs to make a picture.

1. Locate point A at (2, 1).  
Locate point B at (8, 1).  
Locate point C at (9, 2).  
Locate point D at (1, 2).  
Connect A and B.  
Connect B and C.  
Connect C and D.  
Connect D and A.
2. Locate point J at (8, 2).  
Locate point K at (8, 6).  
Locate point L at (9, 4).  
Locate point M at (8, 4).  
Connect J and K.  
Connect K and L.  
Connect L and M.
3. Locate point X at (2, 2).  
Locate point Y at (2, 6).  
Locate point Z at (3, 4).  
Locate point W at (2, 4).  
Connect X and Y.  
Connect Y and Z.  
Connect Z and W.
4. Locate point Q at (5, 2).  
Locate point R at (5, 8).  
Locate point S at (7, 5).  
Locate point T at (5, 5).  
Connect Q and R.  
Connect R and S.  
Connect S and T.

To find point A, first move 2 units to the right. Then move 1 unit up.



# MAINTENANCE

See margin.

**Practice** Number a grid for Exercises 1–5. Then graph and label the points located by the number pairs given. Connect the points as directed, to make a 5-pointed star.

1. V (1, 8)
2. W (11, 8)  
Connect V and W.
3. X (1, 1)  
Connect W and X.
4. Y (6, 11)  
Connect X and Y.
5. Z (11, 1)  
Connect Y and Z.  
Connect V and Z.

See margin.

**Apply** Number a grid and graph these number pairs to make a picture of the constellation, *the Dragon*. Locate the points, label them, and connect them in alphabetical order.

6. A (15, 1)
7. B (13, 2)
8. C (9, 3)
9. D (5, 5)
10. E (5, 7)
11. F (6, 8)
12. G (8, 10)
13. H (11, 12)
14. I (11, 14)
15. J (10, 15)
16. K (8, 14)
17. L (4, 14)
18. M (3, 13)
19. N (1, 13)
20. O (1, 11)
21. P (3, 11)
22. Connect P and M.

Add.

$$\begin{array}{r} 1. \frac{1}{5} \\ + \frac{2}{5} \\ \hline \frac{3}{5} \end{array} \quad \begin{array}{r} 2. \frac{1}{6} \\ + \frac{2}{6} \\ \hline \frac{3}{6} \end{array} \quad \begin{array}{r} 3. \frac{1}{7} \\ + \frac{2}{7} \\ \hline \frac{3}{7} \end{array}$$

$$\begin{array}{r} 4. \frac{2}{4} + \frac{3}{4} \\ \hline \frac{5}{4} \end{array} \quad \begin{array}{r} 5. \frac{3}{8} + \frac{1}{8} \\ \hline \frac{4}{8} \end{array} \quad \begin{array}{r} 6. \frac{1}{6} + \frac{4}{6} \\ \hline \frac{5}{6} \end{array}$$

Subtract.

$$\begin{array}{r} 7. \frac{4}{5} \\ - \frac{1}{5} \\ \hline \frac{3}{5} \end{array} \quad \begin{array}{r} 8. \frac{7}{8} \\ - \frac{3}{8} \\ \hline \frac{4}{8} \end{array} \quad \begin{array}{r} 9. \frac{3}{4} \\ - \frac{1}{4} \\ \hline \frac{2}{4} \end{array}$$

$$10. \frac{2}{3} - \frac{1}{3} \quad 11. \frac{4}{5} - \frac{1}{5} \quad 12. \frac{5}{7} - \frac{3}{7}$$

Add.

$$\begin{array}{r} 13. 8.3 \\ + 5.6 \\ \hline 13.9 \end{array} \quad \begin{array}{r} 14. 4.5 \\ + 7.2 \\ \hline 11.7 \end{array} \quad \begin{array}{r} 15. 25.04 \\ + 36.18 \\ \hline 61.22 \end{array}$$

$$16. 17.63 + 31.12 \quad 17. 45 + 36.73$$

$$18. 3 + 5.6 + 2.7 \quad 19. 13 + 4.9$$

Subtract.

$$\begin{array}{r} 20. 8.6 \\ - 3.5 \\ \hline 5.1 \end{array} \quad \begin{array}{r} 21. 24.3 \\ - 7.6 \\ \hline 16.7 \end{array} \quad \begin{array}{r} 22. 68.73 \\ - 39.59 \\ \hline 29.14 \end{array}$$

$$23. 67.89 - 49.93 \quad 24. 38 - 17.55$$

$$25. 18.7 - 6.8 \quad 26. 0.15 - 0.06$$

## Assignment Guide

basic 1–22  
average 1–22  
enriched 1–22

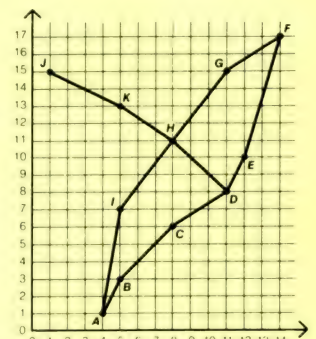
More Practice Set 127,  
page 397

**Homework to do with others** Give students a sheet of coordinate grid paper. Have each student ask another person to help design and produce a simple picture using number pairs. Display the results on a bulletin board.

## Follow-Up

**Extra Practice** To make a picture of the constellation *The Swan*, have students graph and label these points.

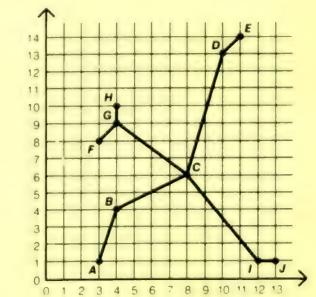
- A (4, 1)  
B (5, 3)  
C (8, 6)  
D (11, 8)  
E (12, 10)  
F (14, 17)  
G (11, 15)  
H (8, 11)  
I (5, 7)  
J (1, 15)  
K (5, 13)



Connect A through I.  
Connect I and A.  
Connect J, K, H, and D.

**Enrichment** To make a picture of the constellation *The Eagle*, have students graph and label these points.

- A (1, 3)  
B (4, 4)  
C (8, 6)  
D (10, 13)  
E (11, 14)  
F (3, 8)  
G (4, 9)  
H (4, 10)  
I (12, 1)  
J (13, 1)



Connect A through E.  
Connect F, G, H.  
Connect G, C, I, and J.

More Practice Set 127, page 397

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## Enrichment 127

Name \_\_\_\_\_ E127

**Enlarging Pictures**

Brian wanted to enlarge a drawing of a cowboy boot and use it in a report. He first traced the boot on graph paper.

1. Write the ordered pair for each point.

A (1, 1) B (2, 2) C (2, 5)  
D (5, 4) E (5, 0) F (4, 0)  
G (4, 1) H (2, 0) I (0, 0)

Then he multiplied each number in the ordered pairs by 2.

2. Write the new ordered pairs.

A<sub>1</sub> (2, 2) B<sub>1</sub> (4, 4) C<sub>1</sub> (4, 10)  
D<sub>1</sub> (10, 8) E<sub>1</sub> (10, 0) F<sub>1</sub> (8, 0)  
G<sub>1</sub> (8, 2) H<sub>1</sub> (4, 0) I<sub>1</sub> (0, 0)

3. Connect the new points in order.

4. Use Brian's method to enlarge the drawing of the house. (Multiply by 2.)

5. Are the new drawings the same shape as the originals?  
**Yes**

## Additional Resource 127

Name \_\_\_\_\_ Additional Resource 127

**Calculator Graphing Costs**

Use me to find the costs.

**Drive through Safari Park**  
Each passenger ... \$0.75

Use your calculator to complete the table.

| Number of passengers | 1      | 2      | 3      | 4      | 5      |
|----------------------|--------|--------|--------|--------|--------|
| Cost                 | \$0.75 | \$1.50 | \$2.25 | \$3.00 | \$3.75 |

Use the table to graph the cost per passenger.

## Daily Maintenance

1.  $13 \times 86$  [1,118]
2.  $24 \times 43$  [1,032]
3.  $12 \times 56$  [672]
4.  $39 \times 22$  [858]
5.  $25 \times 45$  [1,125]



## Objective 128

Solve problems by reading graphs.

### Lesson Theme

Consumer Topics: Cost of Materials

### Materials

- Coordinate Grids (Teaching Aid L)

## Introduction

**Motivational Situation** Pose the following problem to the students. Suppose you are the manager of a craft shop. What are some of the things you would need to decide? [What craft materials to carry, when to order and when to take inventory, what items to display, what prices to charge, and which items are popular]

Remind students that graphs make the representation of many different kinds of information easier to interpret. Explain that students will learn about a new kind of graph in this lesson.

## Using the Pages

**Teach** Stress that the graph in the example is different from a broken-line graph because it forms a straight line. Thus, the amount (rate of growth) between each entry is constant.

**Try** In Exercise a, the student reads the graph to get information. In Exercise b, the student must first read the graph to find the information and then compute using that information to find the answer.

**Apply Problem Solving** Problem 9 is starred because it requires students to determine the cost of five packages, which is not labeled on the chart.

**Additional Problem** Give students the following problem. During a special sale, a bag of 10 packages of yarn is selling for \$5.00 and a bag of 25 packages is selling for \$10.00. If Lester needs 37 packages, what should he buy to save the most money? [One bag of 25, one bag of 10, and two single packages] How much will he save over the regular cost? [\$6.00]

**Choosing a computation method** Read this problem to the students and have them choose whether to estimate or to compute an exact answer. Evelyn has \$10.00. If she buys 3 bags of craft sticks for \$1.98 each, will she have enough money left to buy a set of paints for \$4.50? [Estimate, no]

**Calculator** To solve Problem 10 students can use the graph on page 344 to find the price of each color of yarn separately or they can use the graph to find the cost of one package of yarn and multiply by the number of packages of yarn to find the total cost.

### Problem Solving

### Use a Graph

#### Read

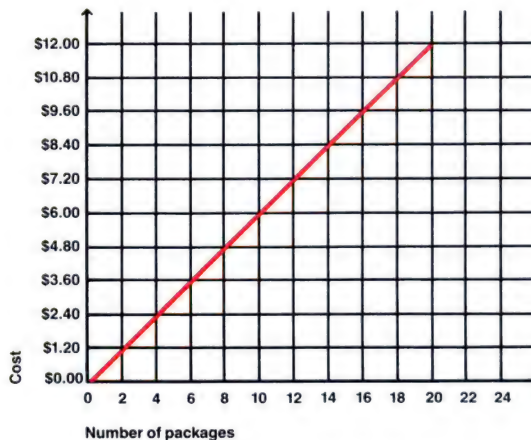
Jennie works in a craft store that sells packages of pre-cut rug yarn. The price of the yarn is \$1.20 for 2 packages. How much should she charge for 20 packages of yarn?

#### Plan

Make a graph to show the prices for different numbers of packages of yarn. Count by 2s to label the bottom of a grid with the number of packages. Label the left side with the prices. Since the price goes up \$1.20 for each additional 2 packages, keep adding \$1.20 to get the next price.

#### Solve

Locate the points for 0 packages at \$0.00, 2 packages at \$1.20, and 4 packages at \$2.40. Connect the points and extend the graph to the grid line for 20 packages.



Read across on the grid line to find the price for 20 packages.

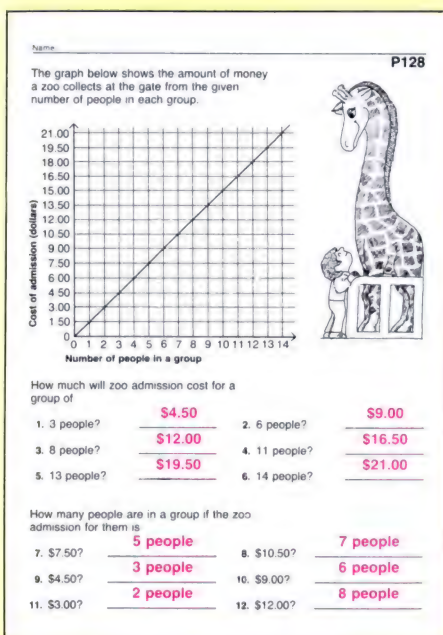
**Answer** Jennie should charge the customer \$12.00.

#### Look Back

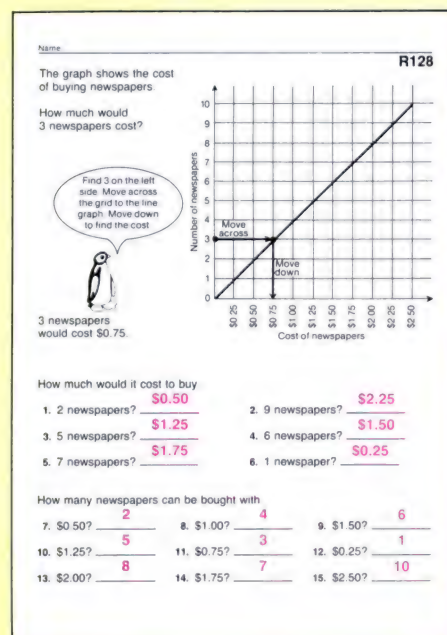
Since 20 packages is 10 times as many as 2 packages, and \$12.00 is 10 times \$1.20, the answer checks.

344

## Practice 128



## Reteaching 128







**Try** Use the graph on page 344. Solve each problem.

- a. Kimiko has \$6.00. How many packages of rug yarn can she buy?  
**10 packages**

- b. Denny bought 18 packages of rug yarn. How much change did he receive from \$15.00?  
**\$4.20**

**Apply** Use the graph on page 344. Solve each problem.

- Margo bought 12 packages of rug yarn. How much did she spend on the yarn?  
**\$7.20**
- Cary spent \$3.60 for rug yarn. How many packages did he buy?  
**6 packages**
- Chuck has \$6.00. What is the greatest number of packages of rug yarn that he can buy?  
**10 packages**
- Mateo bought 16 packages of rug yarn. How much change did he receive from \$10.00?  
**\$0.40**
- Teresa bought 14 packages of rug yarn, rug backing for \$3.70, and rug hook for \$1.25. Find the total cost.  
**\$13.35**
- Emily bought materials to make 3 wall hangings. Each wall hanging required 12 packages of pre-cut rug yarn. How much did Emily spend on the yarn?  
**\$21.60**
- Renee bought 20 packages of rug yarn on sale for \$8.95. How much less was this than the regular price?  
**\$3.05 less**
- Hans bought 14 packages of rug yarn. Roy bought 8 packages. How much more did Hans spend for yarn than Roy?  
**\$3.60 more**
- How much will it cost if Tashi buys 5 packages of pre-cut rug yarn?  
**\$3.00**
- Calculator** Kay bought packages of different colors of yarn. Find the total cost of 20 packages of red, 15 of yellow, 9 of green, and 17 of blue.  
**\$36.60**

More Practice Set 128, page 397 **345**

## Assignment Guide

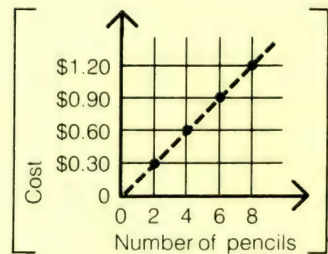
|          |      |
|----------|------|
| basic    | 1-6  |
| average  | 1-8  |
| enriched | 1-10 |

**More Practice Set 128, page 397**

## Follow-Up

**Enrichment** Have students use this information to make a straight-line graph showing the cost of pencils.

| Number of pencils | Cost   |
|-------------------|--------|
| 2                 | \$0.30 |
| 4                 | \$0.60 |
| 6                 | \$0.90 |
| 8                 | \$1.20 |



Ask students to give a rule which describes the pairing that is pictured by the graph. [ $c = 0.15n$ ]

## Calculator

If students have a calculator with an automatic constant function, have them make a table to show the cost of 2 to 10 items at a particular price. Then have them make a line graph with this data.

## Cooperative Learning Groups

See page 485 of this Teacher's Edition.

## Enrichment 128

Name \_\_\_\_\_ E128

**Graphing Scores**

The fourth- and fifth-grade kickball teams played a 6-game tournament. The graph shows the points scored during each game.

| Game | 4th Graders | 5th Graders |
|------|-------------|-------------|
| 1    | 5           | 12          |
| 2    | 10          | 8           |
| 3    | 12          | 10          |
| 4    | 10          | 12          |
| 5    | 12          | 10          |
| 6    | 10          | 12          |

- How many points did the fourth graders score in game 4?  
**10 points**
- How many points did the fifth graders score in game 3?  
**10 points**
- In which game was there the greatest difference in points?  
**Game 5**
- How many more points did the fifth graders score than the fourth graders in game 1?  
**7 more points**
- How many games did the fourth graders win?  
**4 games**
- What was the total number of points that the fifth graders scored?  
**63 points**
- Who won the tournament?  
**The fourth graders**

## Additional Resource 128

Name \_\_\_\_\_ Additional Resource 128

**Project Number Pair Game**

Materials needed: red and yellow spinners numbered 1-3, two game markers

Number of players: 2

- Each player puts a marker in the Start square. The first player spins both spinners. The yellow spinner tells how many squares to move to the right. The red spinner tells how many squares to move up.
- If your marker falls on an instruction square, do what the instruction says. If your marker goes off the board, return to Start and begin again. The winner is the first player to reach the Finish square.

|       |              |              |             |                 |   |   |
|-------|--------------|--------------|-------------|-----------------|---|---|
|       |              |              |             | Finish          |   |   |
| 5     | Go to (6, 2) |              | Extra turn  | Go to Finish    |   |   |
| 4     |              | Go to (6, 4) |             | Return to Start |   |   |
| 3     | Move 5 right |              | Move 3 down | Move 2 left     |   |   |
| 2     |              | Lose a turn  |             | Go to (5, 5)    |   |   |
| 1     | Go to (4, 3) |              | Extra turn  | Move 3 up       |   |   |
| Start |              |              |             |                 |   |   |
|       | 1            | 2            | 3           | 4               | 5 | 6 |
|       |              |              | yellow      |                 |   |   |

## Daily Maintenance

- $783 \div 17$  [46 R1]
- $888 \div 11$  [80 R8]
- $342 \div 32$  [10 R22]
- $296 \div 14$  [21 R2]
- $975 \div 25$  [39]



## Chapter 12 Test

An acceptable score for each objective is suggested on the Chapter 12 Form for Individualizing.

If any reteaching is needed, refer to the following pages.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| 123       | 1-3        | 332-333    |
| 124       | 4-6        | 334-335    |
| 125       | 7-9        | 336-337    |
| 126       | 10-14      | 340-341    |
| 127       | 15-18      | 342-343    |
| 128       | 19, 20     | 344-345    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 20             | 100 | 14             | 70 |
| 19             | 95  | 13             | 65 |
| 18             | 90  | 12             | 60 |
| 17             | 85  | 11             | 55 |
| 16             | 80  | 10             | 50 |
| 15             | 75  |                |    |

### Additional Ideas for Evaluation

See pages 464-467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Chapter 12 Form for Individualizing
- Cumulative Record Folder

## Chapter 12 Test

Piano Practice Hours

|         |      |
|---------|------|
| Steve   | 🕒🕒🕒  |
| Shirley | 🕒🕒   |
| Roger   | 🕒🕒🕒🕒 |

Each 🕒 means 1 hour.

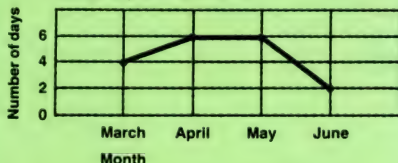
- How many hours did Steve practice?  
**3 hours**
- Who practiced the most hours?  
**Roger**
- Who practiced the fewest hours?  
**Shirley**

Favorite Exercise



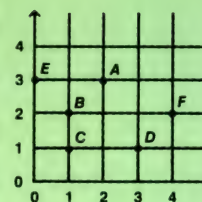
- How many people chose jogging as their favorite exercise?  
**3 people**
- Which exercise did 6 people choose as their favorite?  
**Gymnastics**
- Which exercise was chosen by the most people?  
**Swimming**

Rainy Days Each Month



- How many rainy days were in May?  
**6 days**
- Which month had 4 rainy days?  
**March**
- Which month had 2 rainy days?  
**June**

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- Which letter names the point located by (4, 2)?  
**F**
- Which letter names the point located by (3, 1)?  
**D**

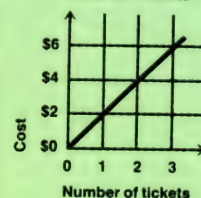
What number pair gives the location of each point?

12. **A**      13. **B**      14. **C**  
**(2, 3)**      **(1, 2)**      **(1, 1)**

Number a grid. Then graph and label the points located by the number pairs given. **See margin.**

15. **W** (4, 1)      16. **X** (2, 4)  
17. **Y** (3, 2)      18. **Z** (5, 3)

Cost of Tickets



- What is the cost of 3 tickets?  
**\$6**
- Lea bought 1 ticket. How much change did she get from \$5.00?  
**\$3**

## Chapter 12 Letter Home

### Keeping You Posted

We have completed the last chapter in our mathematics textbook, covering various kinds of graphs. You may wish to have your child make a graph that shows how much time is spent doing various activities in one week. Activities like those at the bottom of the page will help your child maintain mathematics skills over the summer.

To: Family

Locate each point. Connect the points in the order given. Then complete the last line of the poem.

|            |            |
|------------|------------|
| 1. (4, 3)  | 2. (2, 7)  |
| 3. (0, 1)  | 4. (4, 2)  |
| 5. (6, 0)  | 6. (8, 2)  |
| 7. (12, 1) | 8. (10, 7) |
| 9. (8, 3)  |            |

This animal in flight is seen mainly at night. It uses sound, at that.

This animal is a bat.

### Summer Activities

- Suggest that your child find the total of the ages of all family members and then divide to find the average age of your family. This activity also may be done with other number facts, such as height.
- Suggest that your child observe geometric shapes in everyday life. Have him or her draw their pictures and perhaps name the shapes.

## Chapter 12 Posttest

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

### Posttest Chapter 12

Name \_\_\_\_\_

Drum Practice Hours

|       |     |
|-------|-----|
| Karen | 🕒🕒  |
| Bob   | 🕒   |
| Rita  | 🕒🕒🕒 |

Each 🕒 means 1 hour.

- How many hours did Karen practice?  
**2 hours**
- Who practiced the most hours?  
**Rita**
- Who practiced the fewest hours?  
**Bob**

Favorite Exercise

|             |   |
|-------------|---|
| Walking     | 0 |
| Jogging     | 4 |
| Bike riding | 2 |

- How many people chose walking as their favorite exercise?  
**2 people**
- Which exercise did 4 people choose as their favorite?  
**Jogging**
- Which exercise was chosen by the most people?  
**Bike riding**

Rainy Days Each Month

|       |   |
|-------|---|
| April | 2 |
| May   | 1 |
| June  | 3 |
| July  | 4 |

- How many rainy days were in June?  
**3 days**
- Which month had 4 rainy days?  
**July**
- Which month had 3 rainy days?  
**May**

### Posttest Chapter 12

Name \_\_\_\_\_

Cost of Tickets

|   |   |   |   |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 0 | 1 | 2 | 3 |

- Which letter names the point located by (4, 3)?  
**B**
- Which letter names the point located by (1, 3)?  
**A**

What number pair gives the location of each point?

12. **D**      13. **E**      14. **F**

Number a grid. Then graph and label the points located by the number pairs given.

15. **T** (2, 1)      16. **U** (1, 3)      15-18.

17. **V** (3, 4)      18. **W** (5, 2)

Cost of Tickets

|   |   |   |   |   |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |
| 0 | 1 | 2 | 3 | 4 |

- What is the cost of 2 tickets?  
**\$4.00**
- Dawn bought 4 tickets. How much change did she get from \$10.00?  
**\$2.00**



# CHALLENGE

## Making a Bar Graph

Some computers read digits by using light beams. Each digit may be printed in a square that has 9 regions. The regions are numbered as shown in the square at the right.

The computer reads a digit by the reflection of segments in the region. The squares below show the position of segments that form each of the digits 0–9.

| Region 1 | Region 2 | Region 3 |
|----------|----------|----------|
| Region 4 | Region 9 | Region 5 |
| Region 6 | Region 7 | Region 8 |



Regions Used



Regions Used



Regions Used



Regions Used



Regions Used



Regions Used



Regions Used



Regions Used



Regions Used

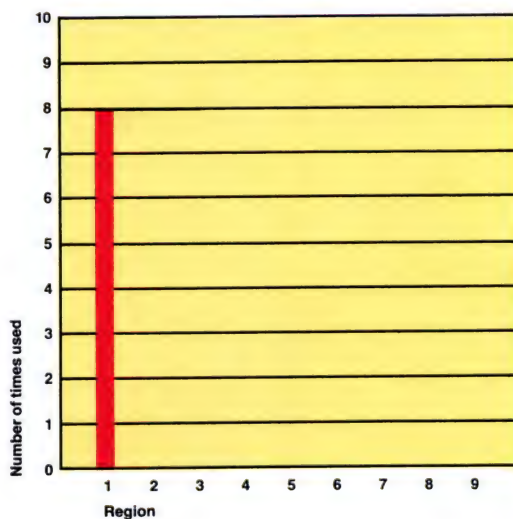


Regions Used

Complete this table to show the number of times each region is used when forming the digits 0–9.

| Region | Number of Times Used |
|--------|----------------------|
| 1      | 8                    |
| 2      | 1. 9                 |
| 3      | 2. 6                 |
| 4      | 3. 7                 |
| 5      | 4. 9                 |
| 6      | 5. 6                 |
| 7      | 6. 8                 |
| 8      | 7. 8                 |
| 9      | 8. 8                 |

9. Make a bar graph using the information in the table at the left. Start your graph like the one below. **See margin.**



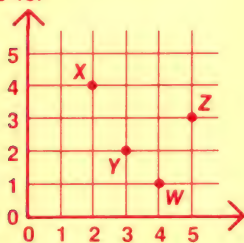
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## Challenge

**Make a graph** Students should use the information given in the yellow boxes under the digits, to count the number of times each region is used to complete the table. When they have finished the table, they should be able to complete the bar graph without any difficulty.

Answers, page 346

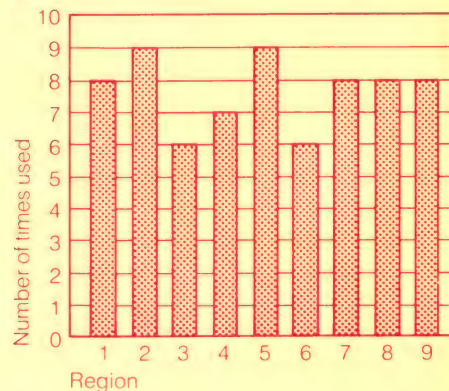
15–18.



Answers, page 347

Challenge

9.





## Using Problem-Solving Strategies

- Make a graph.

### Introduction

Review graphing number pairs. Make sure students remember that the first number in the pair gives the number of units to the right of zero and the second number gives the number of units up.

### Using the Page

Discuss the map with the students. Make certain that they can identify what is located at each point labeled with a letter.

|                      |               |
|----------------------|---------------|
| N = pond             | I = pine tree |
| O = apples (orchard) | E = hut       |
| M = stream           | P = cave      |
| B = bridge           | L = log       |
| D = mail box         | Y = pony      |
| A = trees            | C = fence     |
| V = gravestone       |               |

Read the introductory paragraph with the students. They will *make the graph* to get the number pairs and the letters.

The number pairs in Problem 3 are matched with letters which spell the location, pond, where the friends will meet.

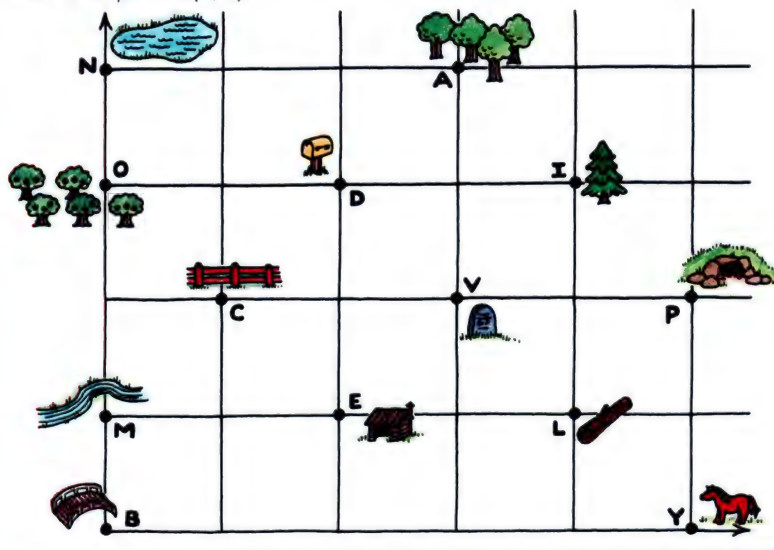
### Follow-Up

Have the students make up clues for other locations on the map. These could include locations of treasures and might mix well with a creative writing lesson.

## Using Problem-Solving Strategies

# THE MEETING PLACE

Pete is to meet his friends out in the country. He drew a grid on the map of the area. Find the location where they are to meet. He knows that the bridge is at point B(0, 0), and that the fence is at point C(1, 2).



- Write the letter of the point which has the number pair (4, 3). **I**
- Write the number pair of the point which has letter name M. **(0, 1)**
- The following number pairs name points on the map. Write the letters of the number pairs, in order, to spell out the location where Pete is to meet his friends.  
(5, 2) (0, 3) (0, 4) (2, 3)

**P O N D**

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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

Maintenance; Choosing a Computation Method, p. 409



## Cumulative Test, Chapters 1–12

Give the letter for the correct answer.

1. Round 643 to the nearest ten.

**A** 640      **C** 650  
**B** 600      **D** 700

2. What does the 8 mean in 18,306?

**A** 8 thousands  
**B** 8 ten-thousands  
**C** 8 hundreds  
**D** 8 ones

3. Add.

**D** 1,051  
**B** 961  
**C** 951  
**D** 1,061

$$\begin{array}{r} 476 \\ + 585 \\ \hline \end{array}$$

4. Subtract.

**D** 4,818  
**B** 4,808  
**C** 3,818  
**D** 3,808

$$\begin{array}{r} 6,284 \\ - 2,476 \\ \hline \end{array}$$

5. What time is shown on this clock?

**B** 7:17      **C** 8:22  
**A** 4:43      **D** 5:43



6. Multiply.

**A** 24,054  
**B** 28,004  
**C** 2,804  
**D** 2,454

$$\begin{array}{r} 4,009 \\ \times 6 \\ \hline \end{array}$$

7. Multiply.

**C** 910  
**B** 1,310  
**C** 1,378  
**D** 978

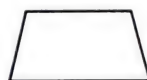
$$\begin{array}{r} 26 \\ \times 53 \\ \hline \end{array}$$

8. Tell whether you *add*, *subtract*, or *multiply*. Solve the problem.

Diego bought a book that costs \$2. He paid with a \$10 bill. How much change did he get?

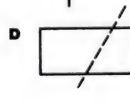
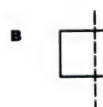
**A** Add; \$12      **C** Subtract; \$8  
**B** Multiply; \$20      **D** Add; \$8

9. How many sides does this figure **D** have?



**A** 3      **B** 5      **C** 6      **D** 4

10. In which figure is the broken line a line of symmetry?



11. Divide.

**B** 5 R3  
**A** 4 R4  
**C** 3 R6  
**D** 4 R5

$$7 \overline{)32}$$

## Cumulative Test, Chapters 1–12

The following objectives are covered in this cumulative test. An asterisk preceding the number indicates that the objective is a target objective.

| Objective | Test items | Text pages |
|-----------|------------|------------|
| * 14      | 1          | 34–35      |
| 17        | 2          | 42–43      |
| * 23      | 3          | 58–59      |
| * 28      | 4          | 70–71      |
| * 33      | 5          | 90–91      |
| * 59      | 6          | 158–159    |
| 62        | 7          | 166–167    |
| 65        | 8          | 174–175    |
| 68        | 9          | 186–187    |
| 75        | 10         | 202–203    |
| 87        | 11         | 234–235    |
| 90        | 12         | 244–245    |
| *103      | 13         | 280–281    |
| *104      | 14         | 282–283    |
| 106       | 15         | 286–287    |
| 107       | 16         | 288–289    |
| 108       | 17         | 290–291    |
| *111      | 18         | 302–303    |
| *112      | 19         | 304–305    |
| 118       | 20         | 316–317    |
| 121       | 21         | 322–323    |
| 124       | 22         | 334–335    |

The chart below can help you determine a percentage score for this test.

| Number correct | %   | Number correct | %  |
|----------------|-----|----------------|----|
| 22             | 100 | 16             | 73 |
| 21             | 95  | 15             | 68 |
| 20             | 91  | 14             | 64 |
| 19             | 86  | 13             | 59 |
| 18             | 82  | 12             | 55 |
| 17             | 77  | 11             | 50 |

### Additional Ideas for Evaluation

See pages 464–467.

### Record Forms

- Class Test Record Form
- Student Test Record Form
- Cumulative Record Folder

## Cumulative Test, Chapters 1–12

Available in the *Teacher's Resource File* (as blackline masters), in *Tests, Duplicating Masters*, and in *Test Booklet*.

Name \_\_\_\_\_

Cumulative Test  
Chapters 1–12

Circle the letter for the correct answer.

1. Round 584 to the nearest ten.  
**A** 580      **C** 590  
**B** 500      **D** 600

2. What does the 2 mean in 12,435?  
**A** 2 thousands  
**B** 2 ten-thousands  
**C** 2 hundreds  
**D** 2 ones

3. Add.  
**A** 1,232  
**B** 1,142  
**C** 1,132  
**D** 1,242

4. Subtract.  
**A** 3,897  
**B** 3,887  
**C** 2,897  
**D** 2,787

5. What time is shown on this clock?  
**A** 7:12      **C** 2:07  
**B** 2:37      **D** 3:37

6. Multiply.  
**A** 35,056  
**B** 40,006  
**C** 4,006  
**D** 3,556

7. Multiply.  
**A** 2,646  
**B** 2,546  
**C** 1,512  
**D** 1,502

8. Tell whether you *add*, *subtract*, or *multiply*. Solve the problem.  
 Roberto bought a book that costs \$5. He paid with a \$10 bill. How much change did he get?  
**A** Add; \$15  
**B** Multiply; \$50  
**C** Subtract; \$5  
**D** Multiply; \$25

9. How many angles does this figure have?  
**A** 3      **B** 5      **C** 6      **D** 4

10. In which figure below is the broken line a line of symmetry?  
**A**      **C**   
**B**      **D**

11. Divide.  
**A** 8 R2  
**B** 7 R3  
**C** 6 R4  
**D** 7 R1

12. Divide.  
**A** 12 R1  
**B** 12 R2  
**C** 10 R1  
**D** 10 R2

Name \_\_\_\_\_

Cumulative Test  
Ch. 1–12 (cont'd)

13. What is nine and eighteen hundredths written as a decimal?  
**A** 9.18      **C** 9.018  
**B** 180.9      **D** 18.09

14. Which decimal has a 6 in the tenths place?  
**A** 4.62      **C** 4.06  
**B** 6.41      **D** 6.31

15. Which number sentence is correct?  
**A**  $4.23 > 4.33$   
**B**  $4.23 < 4.023$   
**C**  $4.23 > 4.03$   
**D**  $4.23 < 4.22$

16. Add.  
**A** 10.5  
**B** 96  
**C** 96  
**D** 9.6

17. Subtract.  
**A** 5.4  
**B** 7.2  
**C** 4.5  
**D** 2.7

18. What fraction of the triangle is shaded?  
**A**  $\frac{4}{8}$       **C**  $\frac{5}{8}$   
**B**  $\frac{3}{8}$       **D**  $\frac{1}{8}$

19. What fraction is shaded?  
**A**  $\frac{1}{5}$       **C**  $\frac{2}{5}$   
**B**  $\frac{3}{5}$       **D**  $\frac{4}{5}$

20. Add.  
**A**  $\frac{7}{18}$   
**B**  $\frac{11}{18}$   
**C**  $\frac{1}{6}$   
**D**  $\frac{1}{3}$

21. Subtract.  
**A** 1  
**B**  $\frac{1}{3}$   
**C**  $\frac{2}{3}$   
**D**  $\frac{1}{6}$

Use this bar graph for question 22.

Students Who Won Prizes

| Grade        | Number of students |
|--------------|--------------------|
| Third grade  | 3                  |
| Fourth grade | 4                  |
| Fifth grade  | 2                  |
| Sixth grade  | 4                  |

22. How many fifth-grade students won prizes?  
**A** 3      **B** 2      **C** 4      **D** 5



Computer

7. ENTER NUMERATOR  
?4  
ENTER DENOMINATOR  
?2  
2
8. ENTER NUMERATOR  
?9  
ENTER DENOMINATOR  
?3  
3
9. ENTER NUMERATOR  
?10  
ENTER DENOMINATOR  
?2  
5
10. ENTER NUMERATOR  
?8  
ENTER DENOMINATOR  
?4  
2
11. ENTER NUMERATOR  
?12  
ENTER DENOMINATOR  
?3  
4
12. ENTER NUMERATOR  
?15  
ENTER DENOMINATOR  
?3  
5

Answers, pages 318–319

- f. Each of the Renners had one half a loaf of French bread. Amanda received her half in 2 equal pieces, which is also 2 fourths of a loaf.

$$\frac{2}{4} = \frac{1}{2}$$

David received his half in 4 equal pieces, which is also 4 eighths of a loaf.

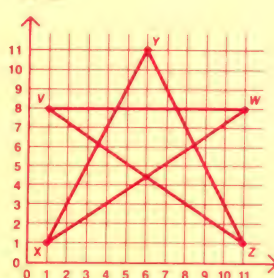
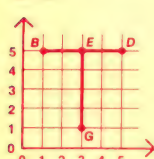
$$\frac{4}{8} = \frac{1}{2}$$

21. 7 days out of 28 days in February can be written as a fraction,  $\frac{7}{28}$ . 7 days is  $\frac{7}{28}$  of the month.  $\frac{7}{28}$  and  $\frac{1}{4}$  are equal fractions.
22. 8 hours out of 24 hours can be written as a fraction,  $\frac{8}{24}$ . 8 hours is  $\frac{8}{24}$  of a day.  $\frac{8}{24}$  and  $\frac{1}{3}$  are equal fractions.

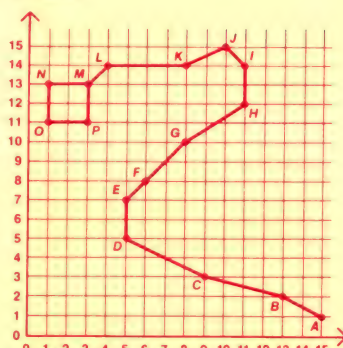
Answers, pages 342–343

a.–d.

1.–5.



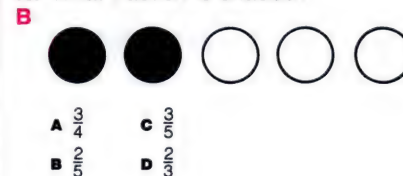
6.–22.



Cumulative Test, Chapters 1–12 continued

12. Divide.  
D  $4 \overline{)83}$   
A 18 R1  
B 18 R3  
C 20 R1  
D 20 R3
13. What is four and sixteen hundredths written as a decimal?  
A 4.16  
B 160.4  
C 4.016  
D 16.04
14. Which decimal has a 4 in the tenths place?  
A 2.41  
B 4.07  
C 3.04  
D 0.54
15. Which number sentence is correct?  
C  
A  $7.11 > 7.21$   
B  $7.11 < 7.11$   
C  $7.11 > 7.01$   
D  $7.11 < 7.10$
16. Add.  
D  $\begin{array}{r} 4.3 \\ + 3.5 \\ \hline \end{array}$   
A 9.6  
B 78  
C .78  
D 7.8
17. Subtract.  
A  $\begin{array}{r} 9.6 \\ - 2.4 \\ \hline \end{array}$   
A 7.2  
B 5.4  
C 2.7  
D 4.5
18. What fraction is shaded?  
B   
A  $\frac{5}{8}$   
B  $\frac{5}{16}$   
C  $\frac{5}{12}$   
D  $\frac{5}{10}$

19. What fraction is shaded?



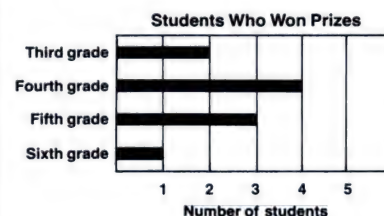
20. Add.

C  $\frac{2}{7} + \frac{3}{7}$   
A  $\frac{5}{14}$   
B  $\frac{9}{10}$   
C  $\frac{5}{7}$   
D  $\frac{4}{5}$

21. Subtract.

D  $\frac{4}{5} - \frac{2}{5}$   
A  $\frac{6}{10}$   
B  $\frac{2}{10}$   
C  $\frac{1}{5}$   
D  $\frac{2}{5}$

Use this bar graph for Exercise 22.



22. How many fifth-grade students won prizes?

A 4    B 3    C 2    D 1



## Contents/Pages 352–433

### **MORE PRACTICE**

pages 352–397

*rainbow tab*

### **MAINTENANCE**

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#### **Choosing a Computation Method**

Calculator, Paper and Pencil, Mental Math, Estimation  
pages 398–409

*blue tab*

#### **Using Problem-Solving Strategies**

pages 410–433

*orange tab*



# MORE PRACTICE

**Set 1** pages 2-3 For each picture, tell if the number is used to count, to measure, to order, or to label.

Answers will vary. Accept any answer the student can justify.



Count, measure

Label

Label

**Set 2** pages 4-5 Write two number sentences to compare each pair of numbers. Use < and >

- |                                     |                                     |                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. 8 and 17<br>$8 < 17, 17 > 8$     | 2. 26 and 45<br>$26 < 45, 45 > 26$  | 3. 19 and 11<br>$11 < 19, 19 > 11$  | 4. 83 and 76<br>$76 < 83, 83 > 76$  | 5. 33 and 42<br>$33 < 42, 42 > 33$  |
| 6. 24 and 42<br>$24 < 42, 42 > 24$  | 7. 91 and 6<br>$6 < 91, 91 > 6$     | 8. 82 and 81<br>$81 < 82, 82 > 81$  | 9. 39 and 64<br>$39 < 64, 64 > 39$  | 10. 21 and 49<br>$21 < 49, 49 > 21$ |
| 11. 52 and 37<br>$37 < 52, 52 > 37$ | 12. 12 and 16<br>$12 < 16, 16 > 12$ | 13. 30 and 40<br>$30 < 40, 40 > 30$ | 14. 62 and 59<br>$59 < 62, 62 > 59$ | 15. 86 and 53<br>$53 < 86, 86 > 53$ |

Write the numbers in order from least to greatest.

- |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|
| 16. 26 12 13<br>12 13 26       | 17. 7 3 9<br>3 7 9             | 18. 32 76 48<br>32 48 76       |
| 19. 49 72 53<br>49 53 72       | 20. 18 6 24<br>6 18 24         | 21. 96 64 35<br>35 64 96       |
| 22. 61 40 26 3<br>3 26 40 61   | 23. 13 44 29 72<br>13 29 44 72 | 24. 81 66 25 14<br>14 25 66 81 |
| 25. 43 37 51 49<br>37 43 49 51 | 26. 21 16 36 32<br>16 21 32 36 | 27. 34 27 53 51<br>27 34 51 53 |



Set 5

- |                  |                  |
|------------------|------------------|
| 6. $4 + 6 = 10$  | 7. $1 + 8 = 9$   |
| $6 + 4 = 10$     | $8 + 1 = 9$      |
| $10 - 4 = 6$     | $9 - 1 = 8$      |
| $10 - 6 = 4$     | $9 - 8 = 1$      |
| 8. $4 + 4 = 8$   | 9. $6 + 7 = 13$  |
| $8 - 4 = 4$      | $7 + 6 = 13$     |
|                  | $13 - 6 = 7$     |
|                  | $13 - 7 = 6$     |
| 10. $6 + 9 = 15$ | 11. $2 + 7 = 9$  |
| $9 + 6 = 15$     | $7 + 2 = 9$      |
| $15 - 6 = 9$     | $9 - 2 = 7$      |
| $15 - 9 = 6$     | $9 - 7 = 2$      |
| 12. $1 + 3 = 4$  | 13. $4 + 9 = 13$ |
| $3 + 1 = 4$      | $9 + 4 = 13$     |
| $4 - 1 = 3$      | $13 - 4 = 9$     |
| $4 - 3 = 1$      | $13 - 9 = 4$     |
| 14. $3 + 5 = 8$  | 15. $7 + 7 = 14$ |
| $5 + 3 = 8$      | $14 - 7 = 7$     |
| $8 - 3 = 5$      |                  |
| $8 - 5 = 3$      |                  |

Set 3 pages 6-7

- |   |   |  |   |   |   |   |   |   |
|---|---|--|---|---|---|---|---|---|
| 1. $\begin{array}{r} 6 \\ +2 \\ \hline 8 \end{array}$   | 2. $\begin{array}{r} 2 \\ +3 \\ \hline 5 \end{array}$   | 3. $\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$  | 4. $\begin{array}{r} 2 \\ +2 \\ \hline 4 \end{array}$   | 5. $\begin{array}{r} 4 \\ +5 \\ \hline 9 \end{array}$   | 6. $\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$   | 7. $\begin{array}{r} 2 \\ +9 \\ \hline 11 \end{array}$  | 8. $\begin{array}{r} 3 \\ +0 \\ \hline 3 \end{array}$   | 9. $\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$  |
| 10. $\begin{array}{r} 5 \\ +6 \\ \hline 11 \end{array}$ | 11. $\begin{array}{r} 8 \\ +7 \\ \hline 15 \end{array}$ | 12. $\begin{array}{r} 3 \\ +3 \\ \hline 6 \end{array}$ | 13. $\begin{array}{r} 1 \\ +4 \\ \hline 5 \end{array}$  | 14. $\begin{array}{r} 8 \\ +2 \\ \hline 10 \end{array}$ | 15. $\begin{array}{r} 2 \\ +4 \\ \hline 6 \end{array}$  | 16. $\begin{array}{r} 6 \\ +8 \\ \hline 14 \end{array}$ | 17. $\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$ | 18. $\begin{array}{r} 3 \\ +5 \\ \hline 8 \end{array}$  |
| 19. $\begin{array}{r} 7 \\ +3 \\ \hline 10 \end{array}$ | 20. $\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$  | 21. $\begin{array}{r} 4 \\ +3 \\ \hline 7 \end{array}$ | 22. $\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$ | 23. $\begin{array}{r} 9 \\ +1 \\ \hline 10 \end{array}$ | 24. $\begin{array}{r} 8 \\ +5 \\ \hline 13 \end{array}$ | 25. $\begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$ | 26. $\begin{array}{r} 7 \\ +3 \\ \hline 10 \end{array}$ | 27. $\begin{array}{r} 4 \\ +6 \\ \hline 10 \end{array}$ |
| 28. $1 + 1 = 2$   | 29. $0 + 9 = 9$   | 30. $8 + 6 = 14$                                       | 31. $9 + 7 = 16$  | 32. $2 + 6 = 8$   | 33. $4 + 8 = 12$  | 34. $8 + 3 = 11$  |   |   |
| 35. $6 + 5 = 11$  | 36. $9 + 8 = 17$  | 37. $5 + 2 = 7$  | 38. $3 + 9 = 12$  | 39. $0 + 4 = 4$   | 40. $6 + 9 = 15$  | 41. $9 + 6 = 15$  |   |   |

Set 4 pages 8-9

- |   |   |   |  |   |   |   |  |
|---|---|---|--|---|---|---|--|
| 1. $\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$   | 2. $\begin{array}{r} 7 \\ -2 \\ \hline 5 \end{array}$   | 3. $\begin{array}{r} 4 \\ -0 \\ \hline 4 \end{array}$   | 4. $\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$ | 5. $\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$   | 6. $\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array}$   | 7. $\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$  | 8. $\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$  |
| 9. $\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$   | 10. $\begin{array}{r} 6 \\ -1 \\ \hline 5 \end{array}$  | 11. $\begin{array}{r} 11 \\ -4 \\ \hline 7 \end{array}$ | 12. $\begin{array}{r} 9 \\ -6 \\ \hline 3 \end{array}$ | 13. $\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$ | 14. $\begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array}$ | 15. $\begin{array}{r} 3 \\ -1 \\ \hline 2 \end{array}$  | 16. $\begin{array}{r} 9 \\ -0 \\ \hline 9 \end{array}$ |
| 17. $\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$ | 18. $\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$ | 19. $\begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array}$  | 20. $\begin{array}{r} 8 \\ -4 \\ \hline 4 \end{array}$ | 21. $\begin{array}{r} 6 \\ -0 \\ \hline 6 \end{array}$  | 22. $\begin{array}{r} 12 \\ -5 \\ \hline 7 \end{array}$ | 23. $\begin{array}{r} 10 \\ -2 \\ \hline 8 \end{array}$ | 24. $\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$ |
| 25. $15 - 8 = 7$  | 26. $14 - 6 = 8$  | 27. $7 - 5 = 2$   | 28. $5 - 1 = 4$  | 29. $17 - 9 = 8$  | 30. $11 - 8 = 3$  | 31. $12 - 9 = 3$  |  |

Set 5 pages 12-13 Tell which fact does not belong to each family.

- |                |                |                 |                |                |
|----------------|----------------|-----------------|----------------|----------------|
| 1. $9 - 2 = 7$ | 2. $4 - 1 = 3$ | 3. $6 + 8 = 14$ | 4. $3 + 6 = 9$ | 5. $5 + 2 = 7$ |
| $2 + 7 = 9$    | $3 + 1 = 4$    | $14 - 6 = 8$    | $3 + 3 = 6$    | $5 + 7 = 12$   |
| $9 - 2 = 7$    | $3 - 1 = 2$    | $8 + 6 = 14$    | $9 - 3 = 6$    | $12 - 7 = 5$   |
| $7 + 2 = 9$    | $1 + 3 = 4$    | $8 - 6 = 2$     | $9 - 6 = 3$    | $7 + 5 = 12$   |
| $9 + 2 = 11$   | $4 - 3 = 1$    | $14 - 8 = 6$    | $6 + 3 = 9$    | $12 - 5 = 7$   |
| $9 + 2 = 11$   | $3 - 1 = 2$    | $8 - 6 = 2$     | $3 + 3 = 6$    | $5 + 2 = 7$    |

Write a family of facts using the given numbers. See margin.

- |               |               |                |               |                |
|---------------|---------------|----------------|---------------|----------------|
| 6. 10   4   6 | 7. 9   8   1  | 8. 4   8       | 9. 6   7   13 | 10. 6   15   9 |
| 11. 2   7   9 | 12. 3   4   1 | 13. 13   9   4 | 14. 5   3   8 | 15. 14   7     |



# MORE PRACTICE

## Set 6 pages 14-15

|   |   |  |   |   |   |   |   |   |
|---|---|--|---|---|---|---|---|---|
| 1. $\begin{array}{r} 6 \\ 5 \\ +3 \\ \hline 14 \end{array}$ | 2. $\begin{array}{r} 2 \\ 8 \\ +7 \\ \hline 17 \end{array}$ | 3. $\begin{array}{r} 1 \\ 4 \\ +2 \\ \hline 7 \end{array}$ | 4. $\begin{array}{r} 9 \\ 1 \\ +5 \\ \hline 15 \end{array}$ | 5. $\begin{array}{r} 6 \\ 6 \\ +2 \\ \hline 14 \end{array}$ | 6. $\begin{array}{r} 3 \\ 5 \\ +2 \\ \hline 10 \end{array}$ | 7. $\begin{array}{r} 4 \\ 8 \\ +5 \\ \hline 17 \end{array}$ | 8. $\begin{array}{r} 1 \\ 3 \\ +9 \\ \hline 13 \end{array}$ | 9. $\begin{array}{r} 7 \\ 5 \\ +4 \\ \hline 16 \end{array}$ |
|---|---|--|---|---|---|---|---|---|

|   |   |   |   |   |   |   |   |  |
|---|---|---|---|---|---|---|---|--|
| 10. $\begin{array}{r} 9 \\ 2 \\ 3 \\ +4 \\ \hline 18 \end{array}$ | 11. $\begin{array}{r} 4 \\ 3 \\ 7 \\ +2 \\ \hline 16 \end{array}$ | 12. $\begin{array}{r} 6 \\ 1 \\ 5 \\ +1 \\ \hline 13 \end{array}$ | 13. $\begin{array}{r} 2 \\ 9 \\ 3 \\ +2 \\ \hline 16 \end{array}$ | 14. $\begin{array}{r} 6 \\ 1 \\ 5 \\ +5 \\ \hline 17 \end{array}$ | 15. $\begin{array}{r} 3 \\ 2 \\ 7 \\ +4 \\ \hline 16 \end{array}$ | 16. $\begin{array}{r} 5 \\ 4 \\ 3 \\ +8 \\ \hline 20 \end{array}$ | 17. $\begin{array}{r} 6 \\ 3 \\ 5 \\ +1 \\ +4 \\ \hline 19 \end{array}$ | 18. $\begin{array}{r} 7 \\ 5 \\ 2 \\ 3 \\ +1 \\ \hline 18 \end{array}$ |
|---|---|---|---|---|---|---|---|--|

|                       |                           |                               |                               |
|-----------------------|---------------------------|-------------------------------|-------------------------------|
| 19. $6 + 3 + 7$<br>16 | 20. $3 + 3 + 4 + 4$<br>14 | 21. $1 + 7 + 2 + 4 + 5$<br>19 | 22. $7 + 6 + 4 + 1 + 1$<br>19 |
|-----------------------|---------------------------|-------------------------------|-------------------------------|

## Set 7 pages 16-17 Tell whether you would add or subtract. Then find the answer.

- Peter has 2 basketballs and 9 tennis balls. How many fewer basketballs than tennis balls does he have?  
**Subtract. 7 fewer basketballs**
- Katie swam 6 laps in her swimming pool in the morning and 5 laps in the afternoon. How many laps did Katie swim in all?  
**Add. 11 laps**
- Lou has 3 brothers. Lisa has 2 more brothers than Lou. How many brothers does Lisa have?  
**Add. 5 brothers**
- Mrs. Estrella had 13 empty flowerpots. She put flowers in 4 of them. How many empty flowerpots did she have left?  
**Subtract. 9 flowerpots**
- Tony had 14 coins in his pocket. 8 of the coins were dimes. How many coins were not dimes?  
**Subtract. 6 coins**
- Jason went to the library. He checked out 4 books about animals, 2 books about rocks and 1 book about trees. How many books did he check out in all?  
**Add. 7 books**

## Set 8 pages 18-19 Give each missing addend.

|                             |                             |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1. $n + 6 = 10$<br>$n = 4$  | 2. $3 + n = 7$<br>$n = 4$   | 3. $n + 7 = 13$<br>$n = 6$  | 4. $5 + n = 8$<br>$n = 3$   | 5. $2 + n = 10$<br>$n = 8$  |
| 6. $4 + n = 12$<br>$n = 8$  | 7. $n + 8 = 9$<br>$n = 1$   | 8. $1 + n = 3$<br>$n = 2$   | 9. $6 + n = 6$<br>$n = 0$   | 10. $4 + n = 11$<br>$n = 7$ |
| 11. $n + 2 = 9$<br>$n = 7$  | 12. $3 + n = 8$<br>$n = 5$  | 13. $8 + n = 9$<br>$n = 1$  | 14. $n + 9 = 16$<br>$n = 7$ | 15. $n + 0 = 5$<br>$n = 5$  |
| 16. $8 + n = 11$<br>$n = 3$ | 17. $6 + n = 12$<br>$n = 6$ | 18. $4 + n = 13$<br>$n = 9$ | 19. $7 + n = 15$<br>$n = 8$ | 20. $n + 8 = 8$<br>$n = 0$  |
| 21. $9 + n = 13$<br>$n = 4$ | 22. $n + 5 = 6$<br>$n = 1$  | 23. $0 + n = 3$<br>$n = 3$  | 24. $n + 7 = 10$<br>$n = 3$ | 25. $7 + n = 9$<br>$n = 2$  |
| 26. $n + 4 = 5$<br>$n = 1$  | 27. $n + 8 = 15$<br>$n = 7$ | 28. $6 + n = 14$<br>$n = 8$ | 29. $9 + n = 9$<br>$n = 0$  | 30. $9 + n = 17$<br>$n = 8$ |



**Set 9** pages 24–25 Use digits to write each number.

1. ~~THL~~ / **6**
2. nineteen **19**
3. fifty-nine **59**
4. seventy-six **76**
5. eighty-four **84**

What is the ones digit in each number?

6. 63 **3**
7. 49 **9**
8. 78 **8**
9. 21 **1**
10. 29 **9**
11. 52 **2**
12. 86 **6**
13. 10 **0**
14. 96 **6**

What is the tens digit in each number?

15. 52 **5**
16. 36 **3**
17. 45 **4**
18. 93 **9**
19. 71 **7**
20. 16 **1**
21. 89 **8**
22. 30 **3**
23. 58 **5**

Using the given digits, write as many two-digit numbers as you can. Do not repeat a digit in a number.

24. 6 and 2 **62, 26**
25. 3 and 7 **37, 73**
26. 9 and 1 **91, 19**
27. 5 and 4 **54, 45**
28. 2 and 8 **28, 82**
29. 7 and 2 **72, 27**

**Set 10** pages 26–27 Write each number in standard form.

1. 6 hundreds 8 tens **680**
2. 9 hundreds 3 ones **903**
3. 4 hundreds 5 ones **405**
4. twenty-seven **27**
5. forty-three **43**
6. eight hundred eleven **811**
7. four hundred twenty **420**
8. five hundred fifty **550**
9. six hundred forty-one **641**

Tell what the 6 means in each number. **See margin.**

10. 46
11. 61
12. 65
13. 267
14. 536
15. 604
16. 96
17. 687
18. 160

Write each number in words. **See margin.**

19. 23
20. 67
21. 501
22. 209
23. 740
24. 320
25. 905
26. 413

**Set 11** pages 28–29 Write each number in standard form.

1.  $8,000 + 200 + 30 + 1$  **8,231**
2.  $6,000 + 100 + 3$  **6,103**
3.  $6,000 + 50 + 4$  **6,054**
4. four thousand, two hundred thirty-seven **4,237**
5. nine thousand, six hundred forty-nine **9,649**
6. three thousand, two hundred five **3,205**
7. six thousand, seven **6,007**

For each number, tell what digit is in the given place.

8. 5,419 (ones) **9**
9. 2,892 (hundreds) **8**
10. 8,625 (thousands) **8**

Write each number in words. **See margin.**

11. 270
12. 902
13. 384
14. 625
15. 8,307
16. 2,000
17. 4,560
18. 3,649

Write each number in expanded form. **See margin.**

19. 238
20. 960
21. 720
22. 3,476
23. 8,621
24. 2,098
25. 5,601

**355**

**Answers, page 355**

**Set 10**

10. 6 ones
11. 6 tens
12. 6 tens
13. 6 tens
14. 6 ones
15. 6 hundreds
16. 6 ones
17. 6 hundreds
18. 6 tens
19. Twenty-three
20. Sixty-seven
21. Five hundred one
22. Two hundred nine
23. Seven hundred forty
24. Three hundred twenty
25. Nine hundred five
26. Four hundred thirteen

**Set 11**

11. Two hundred seventy
12. Nine hundred two
13. Three hundred eighty-four
14. Six hundred twenty-five
15. Eight thousand, three hundred seven
16. Two thousand
17. Four thousand, five hundred sixty
18. Three thousand, six hundred forty-nine
19.  $200 + 30 + 8$
20.  $900 + 60$
21.  $700 + 20$
22.  $3,000 + 400 + 70 + 6$
23.  $8,000 + 600 + 20 + 1$
24.  $2,000 + 90 + 8$
25.  $5,000 + 600 + 1$



# MORE PRACTICE

**Set 12** pages 30-31 Compare the numbers. Use < or >

- |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|
| 1. 634 ● 597<br>>      | 2. 324 ● 416<br><      | 3. 283 ● 277<br>>      | 4. 537 ● 541<br><      |
| 5. 707 ● 712<br><      | 6. 938 ● 944<br><      | 7. 652 ● 651<br>>      | 8. 123 ● 125<br><      |
| 9. 6,407 ● 5,436<br>>  | 10. 2,468 ● 1,934<br>> | 11. 5,021 ● 4,899<br>> | 12. 3,632 ● 4,617<br>< |
| 13. 7,412 ● 7,365<br>> | 14. 3,681 ● 3,826<br>< | 15. 4,213 ● 4,308<br>< | 16. 5,964 ● 5,896<br>> |
| 17. 9,135 ● 9,162<br>< | 18. 8,627 ● 8,613<br>> | 19. 2,534 ● 2,597<br>< | 20. 1,367 ● 1,359<br>> |
| 21. 6,431 ● 6,428<br>> | 22. 1,576 ● 1,579<br>< | 23. 4,638 ● 4,632<br>> | 24. 2,492 ● 2,495<br>< |

**Set 13** pages 32-33 Write the numbers in order from least to greatest.

- |   |   |
|---|---|
| 1. 743 522 659<br>522 659 743                         | 2. 5,324 5,497 5,236<br>5,236 5,324 5,497             |
| 3. 256 235 241 213<br>213 235 241 256                 | 4. 826 804 813 821<br>804 813 821 826                 |
| 5. 2,403 2,386 2,471 2,316<br>2,316 2,386 2,403 2,471 | 6. 9,543 9,547 9,426 9,572<br>9,426 9,543 9,547 9,572 |

Write the numbers in order from greatest to least.

- |  |  |
|--|--|
| 7. 317 282 465<br>465 317 282                          | 8. 516 497 522<br>522 516 497                          |
| 9. 7,652 8,316 7,813<br>8,316 7,813 7,652              | 10. 826 804 813 821<br>826 821 813 804                 |
| 11. 3,814 3,739 3,823 3,904<br>3,904 3,823 3,814 3,739 | 12. 5,364 5,386 5,283 5,394<br>5,394 5,386 5,364 5,283 |

Write the number that is 1,000 greater.

- |                    |                    |                    |                    |                    |                  |                    |
|--------------------|--------------------|--------------------|--------------------|--------------------|------------------|--------------------|
| 13. 3,654<br>4,654 | 14. 7,321<br>8,321 | 15. 5,016<br>6,016 | 16. 2,317<br>3,317 | 17. 4,396<br>5,396 | 18. 720<br>1,720 | 19. 6,043<br>7,043 |
|--------------------|--------------------|--------------------|--------------------|--------------------|------------------|--------------------|

Write the number that is 100 greater.

- |                |                |                    |                    |                    |                    |                    |
|----------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 20. 592<br>692 | 21. 230<br>330 | 22. 1,346<br>1,446 | 23. 4,825<br>4,925 | 24. 3,154<br>3,254 | 25. 6,597<br>6,697 | 26. 2,034<br>2,134 |
|----------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|

Write the number that is 10 greater.

- |                |                |                    |                    |                    |                    |                    |
|----------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 27. 417<br>427 | 28. 560<br>570 | 29. 2,835<br>2,845 | 30. 9,631<br>9,641 | 31. 1,203<br>1,213 | 32. 6,907<br>6,917 | 33. 5,696<br>5,706 |
|----------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|

**Set 14** pages 34-35 Round each number to the nearest ten.

- |                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1. 27<br>30    | 2. 86<br>90    | 3. 51<br>50    | 4. 35<br>40    | 5. 18<br>20    | 6. 73<br>70    | 7. 32<br>30    | 8. 65<br>70    |
| 9. 66<br>70    | 10. 92<br>90   | 11. 45<br>50   | 12. 352<br>350 | 13. 798<br>800 | 14. 345<br>350 | 15. 116<br>120 | 16. 349<br>350 |
| 17. 364<br>360 | 18. 543<br>540 | 19. 867<br>870 | 20. 716<br>720 | 21. 265<br>270 | 22. 654<br>650 | 23. 981<br>980 | 24. 425<br>430 |



Round each number to the nearest hundred.

25. 627    26. 437    27. 264    28. 103    29. 356    30. 931    31. 545    32. 879  
 600    400    300    100    400    900    500    900  
 33. 760    34. 523    35. 379    36. 450    37. 262    38. 830    39. 176    40. 650  
 800    500    400    500    300    800    200    700  
 41. 684    42. 263    43. 935    44. 197    45. 723    46. 650    47. 349    48. 603  
 700    300    900    200    700    700    300    600

**Set 15** pages 36-37 Round each number to the nearest thousand.

1. 2,347    2. 1,845    3. 8,501    4. 6,916    5. 3,624    6. 5,039    7. 2,395  
 2,000    2,000    9,000    7,000    4,000    5,000    2,000  
 8. 1,193    9. 6,500    10. 9,296    11. 4,902    12. 2,499    13. 4,628    14. 8,146  
 1,000    7,000    9,000    5,000    2,000    5,000    8,000  
 15. 6,381    16. 3,746    17. 1,250    18. 7,695    19. 8,500    20. 2,503    21. 3,555  
 6,000    4,000    1,000    8,000    9,000    3,000    4,000

Round each number to the nearest hundred.

22. 823    23. 564    24. 872    25. 649    26. 750    27. 125    28. 906  
 800    600    900    600    800    100    900  
 29. 7,842    30. 1,450    31. 2,923    32. 6,365    33. 9,489    34. 4,648    35. 7,009  
 7,800    1,500    2,900    6,400    9,500    4,600    7,000  
 36. 5,492    37. 3,602    38. 8,172    39. 2,043    40. 3,050    41. 1,111    42. 8,555  
 5,500    3,600    8,200    2,000    3,100    1,100    8,600

**Set 16** pages 40-41 Solve each problem. Use the table below.

**Westdale Mayoral Election Results**

| Polling Place            | Ann Thompson | Mike Sanchez |
|--------------------------|--------------|--------------|
| Jefferson School         | 2,014        | 3,938        |
| Grant Junior High School | 2,392        | 5,947        |
| Jackson School           | 597          | 1,155        |
| Hamilton School          | 4,056        | 893          |
| Westdale High School     | 6,544        | 3,928        |

- Find the vote total for Mike Sanchez at Jackson School to the nearest thousand.  
**1,000 votes**
- Find the vote total for Ann Thompson at Hamilton School to the nearest hundred.  
**4,100 votes**
- List the vote totals for Ann Thompson in order from least to greatest.  
**597 2,014 2,392 4,056 6,544**
- List the vote totals for Mike Sanchez in order from greatest to least.  
**5,947 3,938 3,928 1,155 893**
- At which polling places did Ann Thompson have more votes than Mike Sanchez?  
**Hamilton School, Westdale High School**



Set 17

9. 7 ten-thousands
10. 7 hundreds
11. 7 thousands
12. 7 hundred-thousands
13. 7 ones
14. 7 hundred-thousands
15. 7 thousands
16. 7 tens
17. 7 hundred-thousands
18. 7 tens
19. 7 ten-thousands
20. 7 hundreds

Set 18

5. 2 hundred-thousands
6. 2 thousands
7. 2 millions
8. 2 hundred-thousands
9. 2 millions
10. 2 ten-millions
11. 2 hundred-thousands
12. 2 hundreds
13. 2 millions
14. 2 hundreds
15. 2 ten-millions
16. 2 tens
17. 2 ten-millions
18. 2 ten-thousands
19. 2 ten-thousands

# MORE PRACTICE

Set 17 pages 42–43 Write each number in standard form.

1.  $70,000 + 2,000 + 100 + 90 + 2$   
72,192
2.  $600,000 + 20,000 + 3,000$   
623,000
3.  $400,000 + 30,000 + 7,000 + 60$   
437,060
4.  $70,000 + 900$   
70,900
5. two hundred sixty thousand, eight hundred seventy-six  
260,876
6. thirty-four thousand, nine hundred twenty-seven  
34,927
7. six hundred thirty-four thousand  
634,000
8. one hundred fifty-two thousand, six  
152,006

Tell what the 7 means in each number. See margin.

- |             |             |             |             |             |             |
|-------------|-------------|-------------|-------------|-------------|-------------|
| 9. 73,042   | 10. 134,728 | 11. 97,438  | 12. 739,461 | 13. 64,397  | 14. 764,398 |
| 15. 637,941 | 16. 368,574 | 17. 796,545 | 18. 396,674 | 19. 476,300 | 20. 26,742  |

Set 18 pages 44–45 Write each number in standard form.

1. four hundred ninety six million, three hundred twenty-five thousand, six hundred seventeen  
496,325,617
2. thirty-nine million, two hundred nine thousand, three hundred forty-eight  
39,209,348
3. six million, five hundred twelve thousand, forty-three  
6,512,043
4. sixteen million, forty thousand, fifteen  
16,040,015

Tell what the 2 means in each number. See margin.

- |                 |                 |                |                 |                |
|-----------------|-----------------|----------------|-----------------|----------------|
| 5. 3,235,006    | 6. 87,392,513   | 7. 342,839,117 | 8. 83,297,693   | 9. 32,076,964  |
| 10. 26,398,015  | 11. 503,263,061 | 12. 8,374,265  | 13. 2,397,614   | 14. 65,394,267 |
| 15. 620,845,366 | 16. 6,346,524   | 17. 23,074,698 | 18. 694,327,059 | 19. 8,021,985  |

Set 19 pages 46–47 Choose the most sensible answer.

1. How many students are in Mary's gym class?  
3    30    300  
30
2. John's scout troop went on a hike for 2 hours. How many miles did they hike?  
6    60    600  
6
3. How much did Jim charge to mow his neighbor's lawn?  
\$5    \$50    \$5,000  
\$5
4. How much will it cost to buy 10 new swingsets for the parks in Brookdale?  
\$7    \$70    \$7,000  
\$7,000
5. How many minutes does it take Mrs. Patel to prepare dinner?  
4    40    400  
40
6. How many gallons of water does it take to fill a swimming pool?  
8    80    8,000  
8,000



**Set 20** pages 52-53 Estimate each sum.

First round both numbers to the nearest ten.

1.  $29 + 11$       2.  $56 + 39$       3.  $42 + 21$       4.  $263 + 17$       5.  $447 + 28$       6.  $45 + 231$   
 40      100      60      280      480      280

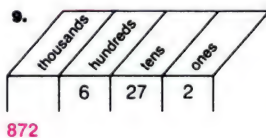
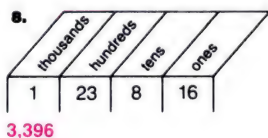
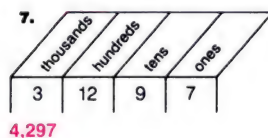
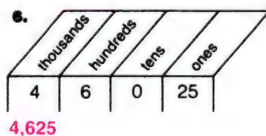
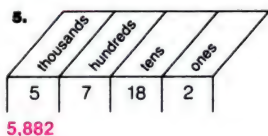
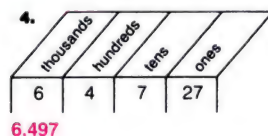
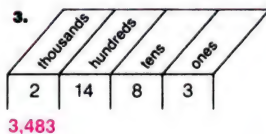
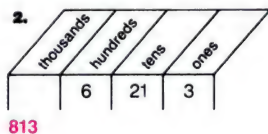
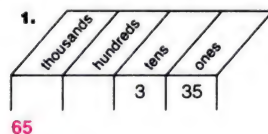
First round both numbers to the nearest hundred.

7.  $523 + 274$       8.  $264 + 309$       9.  $705 + 236$       10.  $3,183 + 595$       11.  $1,431 + 362$   
 800      600      900      3,800      1,800

First round both numbers to the nearest thousand.

12.  $5,638 + 1,247$       13.  $3,057 + 2,595$       14.  $2,500 + 3,483$       15.  $5,460 + 2,803$   
 7,000      6,000      6,000      8,000

**Set 21** pages 54-55 Rename. Write the standard form.



**Set 22** pages 56-57

1.  $\begin{array}{r} 57 \\ + 24 \\ \hline 81 \end{array}$       2.  $\begin{array}{r} 36 \\ + 47 \\ \hline 83 \end{array}$       3.  $\begin{array}{r} 79 \\ + 16 \\ \hline 95 \end{array}$       4.  $\begin{array}{r} 64 \\ + 18 \\ \hline 82 \end{array}$       5.  $\begin{array}{r} 526 \\ + 155 \\ \hline 681 \end{array}$       6.  $\begin{array}{r} 372 \\ + 154 \\ \hline 526 \end{array}$       7.  $\begin{array}{r} 293 \\ + 264 \\ \hline 557 \end{array}$
8.  $\begin{array}{r} 413 \\ + 195 \\ \hline 608 \end{array}$       9.  $\begin{array}{r} 3,628 \\ + 1,851 \\ \hline 5,479 \end{array}$       10.  $\begin{array}{r} 5,042 \\ + 2,374 \\ \hline 7,416 \end{array}$       11.  $\begin{array}{r} 4,246 \\ + 3,952 \\ \hline 8,198 \end{array}$       12.  $\begin{array}{r} 573 \\ + 64 \\ \hline 637 \end{array}$       13.  $\begin{array}{r} 695 \\ + 83 \\ \hline 778 \end{array}$       14.  $\begin{array}{r} 6,453 \\ + 626 \\ \hline 7,079 \end{array}$
15.  $58 + 28$       16.  $783 + 46$       17.  $334 + 275$       18.  $6,847 + 137$       19.  $3,041 + 5,639$   
 86      829      609      6,984      8,680



# MORE PRACTICE

## Set 23 pages 58-59

- |  |  |   |   |  |  |  |  |
|--|--|---|---|--|--|--|--|
| 1. $\begin{array}{r} 364 \\ + 278 \\ \hline 642 \end{array}$       | 2. $\begin{array}{r} 693 \\ + 138 \\ \hline 831 \end{array}$     | 3. $\begin{array}{r} 245 \\ + 376 \\ \hline 621 \end{array}$        | 4. $\begin{array}{r} 563 \\ + 338 \\ \hline 901 \end{array}$        | 5. $\begin{array}{r} 373 \\ + 259 \\ \hline 632 \end{array}$ | 6. $\begin{array}{r} 454 \\ + 267 \\ \hline 721 \end{array}$ | 7. $\begin{array}{r} 5,386 \\ + 2,437 \\ \hline 7,823 \end{array}$ |  |
| 8. $\begin{array}{r} 2,726 \\ + 1,435 \\ \hline 4,161 \end{array}$ | 9. $\begin{array}{r} 4,536 \\ + 476 \\ \hline 5,012 \end{array}$ | 10. $\begin{array}{r} 2,794 \\ + 5,407 \\ \hline 8,201 \end{array}$ | 11. $\begin{array}{r} 3,842 \\ + 4,683 \\ \hline 8,525 \end{array}$ | 12. $\begin{array}{r} 297 \\ + 16 \\ \hline 313 \end{array}$ | 13. $\begin{array}{r} 583 \\ + 48 \\ \hline 631 \end{array}$ | 14. $\begin{array}{r} 7,365 \\ + 758 \\ \hline 8,123 \end{array}$  |  |
| 15. $6,528 + 5,683$<br>12,211                                      | 16. $3,635 + 7,395$<br>11,030                                    | 17. $2,936 + 657$<br>3,593  | 18. $564 + 859$<br>1,423  |  |  |  |  |

## Set 24 pages 60-61

- |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 1. $\begin{array}{r} 3 \\ 8 \\ + 25 \\ \hline 36 \end{array}$               | 2. $\begin{array}{r} 16 \\ 37 \\ + 5 \\ \hline 58 \end{array}$              | 3. $\begin{array}{r} 85 \\ 21 \\ + 36 \\ \hline 142 \end{array}$        | 4. $\begin{array}{r} 43 \\ 54 \\ + 28 \\ \hline 125 \end{array}$        | 5. $\begin{array}{r} 261 \\ 107 \\ + 324 \\ \hline 692 \end{array}$         | 6. $\begin{array}{r} 116 \\ 231 \\ + 522 \\ \hline 869 \end{array}$         | 7. $\begin{array}{r} 352 \\ 416 \\ + 283 \\ \hline 1,051 \end{array}$                 |
| 8. $\begin{array}{r} 1,872 \\ 3,410 \\ + 2,016 \\ \hline 7,298 \end{array}$ | 9. $\begin{array}{r} 3,651 \\ 1,342 \\ + 4,465 \\ \hline 9,458 \end{array}$ | 10. $\begin{array}{r} 23 \\ 12 \\ 46 \\ + 34 \\ \hline 115 \end{array}$ | 11. $\begin{array}{r} 38 \\ 51 \\ 19 \\ + 72 \\ \hline 180 \end{array}$ | 12. $\begin{array}{r} 317 \\ 103 \\ 232 \\ + 116 \\ \hline 768 \end{array}$ | 13. $\begin{array}{r} 406 \\ 231 \\ 152 \\ + 115 \\ \hline 904 \end{array}$ | 14. $\begin{array}{r} 2,318 \\ 1,726 \\ 1,452 \\ + 2,564 \\ \hline 8,060 \end{array}$ |
| 15. $48 + 78 + 51$<br>177   | 16. $61 + 253 + 647$<br>961   | 17. $306 + 224 + 152$<br>682  | 18. $16 + 23 + 15 + 34$<br>88   | 19. $42 + 325 + 18 + 241$<br>626  | 20. $223 + 145 + 509 + 372$<br>1,249  |   |

## Set 25 pages 64-65 Estimate each difference.

First round both numbers to the nearest ten.

- |                    |                     |                      |                       |                      |                       |
|--------------------|---------------------|----------------------|-----------------------|----------------------|-----------------------|
| 1. $23 - 14$<br>10 | 2. $88 - 26$<br>60  | 3. $91 - 38$<br>50   | 4. $56 - 31$<br>30    | 5. $71 - 47$<br>20   | 6. $52 - 39$<br>10    |
| 7. $65 - 29$<br>40 | 8. $164 - 73$<br>90 | 9. $175 - 46$<br>130 | 10. $152 - 29$<br>120 | 11. $117 - 36$<br>80 | 12. $132 - 28$<br>100 |

First round both numbers to the nearest hundred.

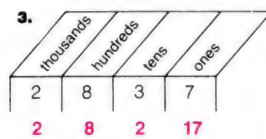
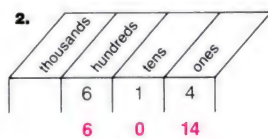
- |                            |                            |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 13. $735 - 316$<br>400     | 14. $812 - 263$<br>500     | 15. $524 - 303$<br>200     | 16. $465 - 207$<br>300     | 17. $677 - 214$<br>500     |
| 18. $1,382 - 304$<br>1,100 | 19. $1,627 - 287$<br>1,300 | 20. $1,816 - 504$<br>1,300 | 21. $1,553 - 496$<br>1,100 | 22. $1,907 - 878$<br>1,000 |

First round both numbers to the nearest thousand.

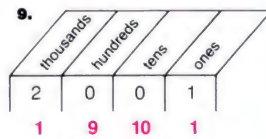
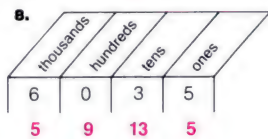
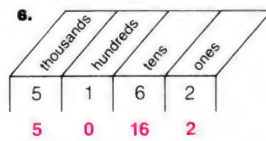
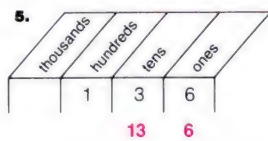
- |                              |                              |                              |                              |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 23. $1,724 - 1,046$<br>1,000 | 24. $6,070 - 1,663$<br>4,000 | 25. $7,542 - 2,700$<br>5,000 | 26. $3,097 - 1,020$<br>2,000 |
| 27. $4,238 - 2,106$<br>2,000 | 28. $5,876 - 2,245$<br>4,000 | 29. $8,082 - 5,703$<br>2,000 | 30. $6,500 - 1,500$<br>5,000 |



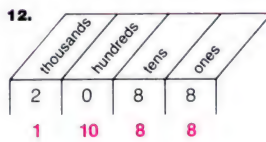
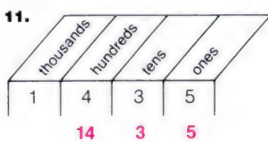
**Set 26** pages 66–67 Rename to show 10 more ones.



Rename to show 10 more tens.



Rename to show 10 more hundreds.



**Set 27** pages 68–69

1.  $\begin{array}{r} 35 \\ - 16 \\ \hline 19 \end{array}$

2.  $\begin{array}{r} 83 \\ - 49 \\ \hline 34 \end{array}$

3.  $\begin{array}{r} 64 \\ - 37 \\ \hline 27 \end{array}$

4.  $\begin{array}{r} 50 \\ - 24 \\ \hline 26 \end{array}$

5.  $\begin{array}{r} 346 \\ - 175 \\ \hline 171 \end{array}$

6.  $\begin{array}{r} 263 \\ - 126 \\ \hline 137 \end{array}$

7.  $\begin{array}{r} 819 \\ - 247 \\ \hline 572 \end{array}$

8.  $\begin{array}{r} 4,583 \\ - 1,741 \\ \hline 2,842 \end{array}$

9.  $\begin{array}{r} 3,528 \\ - 2,463 \\ \hline 1,065 \end{array}$

10.  $\begin{array}{r} 9,627 \\ - 4,208 \\ \hline 5,419 \end{array}$

11.  $\begin{array}{r} 297 \\ - 38 \\ \hline 259 \end{array}$

12.  $\begin{array}{r} 527 \\ - 73 \\ \hline 454 \end{array}$

13.  $\begin{array}{r} 2,651 \\ - 471 \\ \hline 2,180 \end{array}$

14.  $\begin{array}{r} 3,176 \\ - 452 \\ \hline 2,724 \end{array}$

15.  $6,425 - 1,274$   
**5,151**

16.  $418 - 263$   
**155**

17.  $4,835 - 681$   
**4,154**

18.  $7,631 - 4,215$   
**3,416**

19.  $5,387 - 626$   
**4,761**

20.  $9,465 - 6,274$   
**3,191**

21.  $623 - 82$   
**541**

22.  $9,246 - 85$   
**9,161**



# MORE PRACTICE

## Set 28 pages 70-71

- |  |  |   |   |  |   |   |
|--|--|---|---|--|---|---|
| 1. $\begin{array}{r} 312 \\ - 46 \\ \hline 266 \end{array}$      | 2. $\begin{array}{r} 645 \\ - 76 \\ \hline 569 \end{array}$      | 3. $\begin{array}{r} 320 \\ - 35 \\ \hline 285 \end{array}$         | 4. $\begin{array}{r} 532 \\ - 186 \\ \hline 346 \end{array}$        | 5. $\begin{array}{r} 411 \\ - 243 \\ \hline 168 \end{array}$ | 6. $\begin{array}{r} 760 \\ - 286 \\ \hline 474 \end{array}$      | 7. $\begin{array}{r} 963 \\ - 268 \\ \hline 695 \end{array}$        |
| 8. $\begin{array}{r} 2,846 \\ - 379 \\ \hline 2,467 \end{array}$ | 9. $\begin{array}{r} 7,652 \\ - 847 \\ \hline 6,805 \end{array}$ | 10. $\begin{array}{r} 5,764 \\ - 2,697 \\ \hline 3,067 \end{array}$ | 11. $\begin{array}{r} 6,283 \\ - 3,791 \\ \hline 2,492 \end{array}$ | 12. $\begin{array}{r} 656 \\ - 68 \\ \hline 588 \end{array}$ | 13. $\begin{array}{r} 2,346 \\ - 678 \\ \hline 1,668 \end{array}$ | 14. $\begin{array}{r} 4,356 \\ - 1,478 \\ \hline 2,878 \end{array}$ |
| 15. $560 - 74$<br>486  | 16. $4,265 - 1,572$<br>2,693                                     | 17. $8,174 - 3,259$<br>4,915  | 18. $6,271 - 652$<br>5,619  |  |   |   |

## Set 29 pages 72-73

- |  |  |  |   |   |   |   |
|--|--|--|---|---|---|---|
| 1. $\begin{array}{r} 700 \\ - 324 \\ \hline 376 \end{array}$ | 2. $\begin{array}{r} 402 \\ - 159 \\ \hline 243 \end{array}$ | 3. $\begin{array}{r} 807 \\ - 588 \\ \hline 219 \end{array}$ | 4. $\begin{array}{r} 500 \\ - 236 \\ \hline 264 \end{array}$        | 5. $\begin{array}{r} 900 \\ - 761 \\ \hline 139 \end{array}$        | 6. $\begin{array}{r} 304 \\ - 175 \\ \hline 129 \end{array}$        | 7. $\begin{array}{r} 806 \\ - 98 \\ \hline 708 \end{array}$         |
| 8. $\begin{array}{r} 401 \\ - 73 \\ \hline 328 \end{array}$  | 9. $\begin{array}{r} 705 \\ - 49 \\ \hline 656 \end{array}$  | 10. $\begin{array}{r} 600 \\ - 53 \\ \hline 547 \end{array}$ | 11. $\begin{array}{r} 3,500 \\ - 1,385 \\ \hline 2,115 \end{array}$ | 12. $\begin{array}{r} 7,804 \\ - 5,687 \\ \hline 2,117 \end{array}$ | 13. $\begin{array}{r} 6,301 \\ - 2,182 \\ \hline 4,119 \end{array}$ | 14. $\begin{array}{r} 9,700 \\ - 7,418 \\ \hline 2,282 \end{array}$ |
| 15. $3,023 - 74$<br>2,949                                    | 16. $6,040 - 756$<br>5,284                                   | 17. $5,006 - 412$<br>4,594                                   | 18. $8,000 - 2,342$<br>5,658  |   |   |   |

**Set 30 pages 76-77** Check each answer. Tell whether it is right or wrong. If it is wrong, give the correct answer.

- |  |  |  |  |   |  |   |
|--|--|--|--|---|--|---|
| 1. $\begin{array}{r} 23 \\ + 97 \\ \hline 120 \end{array}$<br>Right      | 2. $\begin{array}{r} 56 \\ + 89 \\ \hline 145 \end{array}$<br>Right  | 3. $\begin{array}{r} 564 \\ + 227 \\ \hline 801 \end{array}$<br>Wrong<br>791 | 4. $\begin{array}{r} 691 \\ + 286 \\ \hline 877 \end{array}$<br>Wrong<br>977 | 5. $\begin{array}{r} 3,436 \\ + 5,921 \\ \hline 9,357 \end{array}$<br>Right         | 6. $\begin{array}{r} 1,267 \\ + 2,185 \\ \hline 3,442 \end{array}$<br>Wrong<br>3,452 | 7. $\begin{array}{r} 3,848 \\ + 3,361 \\ \hline 7,209 \end{array}$<br>Right           |
| 8. $\begin{array}{r} 53 \\ - 27 \\ \hline 36 \end{array}$<br>Wrong<br>26 | 9. $\begin{array}{r} 286 \\ - 58 \\ \hline 228 \end{array}$<br>Right | 10. $\begin{array}{r} 726 \\ - 64 \\ \hline 662 \end{array}$<br>Right        | 11. $\begin{array}{r} 513 \\ - 197 \\ \hline 316 \end{array}$<br>Right       | 12. $\begin{array}{r} 8,647 \\ - 928 \\ \hline 8,719 \end{array}$<br>Wrong<br>7,719 | 13. $\begin{array}{r} 5,006 \\ - 2,741 \\ \hline 2,265 \end{array}$<br>Right         | 14. $\begin{array}{r} 9,084 \\ - 1,293 \\ \hline 8,211 \end{array}$<br>Wrong<br>7,791 |

Watch the signs. Check each answer.

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 15. $\begin{array}{r} 374 \\ + 563 \\ \hline 937 \end{array}$     | 16. $\begin{array}{r} 807 \\ - 234 \\ \hline 573 \end{array}$     | 17. $\begin{array}{r} 618 \\ - 249 \\ \hline 369 \end{array}$       | 18. $\begin{array}{r} 288 \\ + 437 \\ \hline 725 \end{array}$       | 19. $\begin{array}{r} 700 \\ - 231 \\ \hline 469 \end{array}$       | 20. $\begin{array}{r} 403 \\ + 298 \\ \hline 701 \end{array}$       |
| 21. $\begin{array}{r} 6,073 \\ - 425 \\ \hline 5,648 \end{array}$ | 22. $\begin{array}{r} 4,265 \\ + 354 \\ \hline 4,619 \end{array}$ | 23. $\begin{array}{r} 2,685 \\ + 6,256 \\ \hline 8,941 \end{array}$ | 24. $\begin{array}{r} 8,264 \\ - 3,381 \\ \hline 4,883 \end{array}$ | 25. $\begin{array}{r} 7,002 \\ - 3,849 \\ \hline 3,153 \end{array}$ | 26. $\begin{array}{r} 2,525 \\ + 3,475 \\ \hline 6,000 \end{array}$ |



**Set 31** pages 78-79

- |   |   |   |  |   |   |
|---|---|---|--|---|---|
| 1. $\begin{array}{r} \$6.37 \\ + 0.71 \\ \hline \$7.08 \end{array}$ | 2. $\begin{array}{r} \$2.56 \\ + 3.89 \\ \hline \$6.45 \end{array}$ | 3. $\begin{array}{r} \$0.73 \\ + 0.76 \\ \hline \$1.49 \end{array}$ | 4. $\begin{array}{r} \$7.58 \\ + 0.98 \\ \hline \$8.56 \end{array}$    | 5. $\begin{array}{r} \$13.84 \\ + 7.63 \\ \hline \$21.47 \end{array}$ | 6. $\begin{array}{r} \$53.98 \\ + 15.26 \\ \hline \$69.24 \end{array}$  |
| 7. $\begin{array}{r} \$6.45 \\ - 3.82 \\ \hline \$2.63 \end{array}$ | 8. $\begin{array}{r} \$7.00 \\ - 4.25 \\ \hline \$2.75 \end{array}$ | 9. $\begin{array}{r} \$9.50 \\ - 3.99 \\ \hline \$5.51 \end{array}$ | 10. $\begin{array}{r} \$22.87 \\ - 9.68 \\ \hline \$13.19 \end{array}$ | 11. $\begin{array}{r} \$16.05 \\ - 8.40 \\ \hline \$7.65 \end{array}$ | 12. $\begin{array}{r} \$95.36 \\ - 76.29 \\ \hline \$19.07 \end{array}$ |

**Set 32** pages 82-83 Write an equation. Then give the answer.

- On Friday, 316 people attended the play at Nole School. On Saturday, 83 more people attended the play than on Friday. How many people attended the play on Saturday?  
 $316 + 83 = n$  **399 people**
- Colin counted 46 cars, 12 vans, 23 trucks, and 4 buses on his way home from school. How many vehicles did he count in all?  
 $46 + 12 + 23 + 4 = n$  **85 vehicles**
- Jill read 45 pages of her book. Yoshio read 16 pages less than Jill. How many pages did Yoshio read?  
 $45 - 16 = n$  **29 pages**
- Tim weighs 84 pounds. Lee weighs 78 pounds. Tarik weighs 81 pounds. What is their total weight?  
 $84 + 78 + 81 = n$  **243 pounds**
- Tanya's family traveled 923 miles on their vacation. Sam's family traveled 268 miles less than Tanya's family. How many miles did Sam's family travel?  
 $923 - 268 = n$  **655 miles**
- The total for Mr. Murphy's paint supplies was \$12.73. He paid for them with a \$20.00 bill. How much money did Mr. Murphy get back?  
 $\$20.00 - \$12.73 = n$  **\$7.27**
- Tina delivered 193 newspapers. Tom delivered 184 newspapers. How many newspapers did they deliver in all?  
 $193 + 184 = n$  **377 newspapers**
- Rita bought a pair of shoes on sale for \$16.99. Before the sale the shoes cost \$24.00. How much did Rita save?  
 $\$24.00 - \$16.99 = n$  **\$7.01**

**Set 33** pages 90-91 Write the time shown. Then write the time indicated under the clock.



3 hours later  
**4:15, 7:15**



6 hours later  
**1:30, 7:30**



25 minutes later  
**6:10, 6:35**



10 minutes later  
**8:55, 9:05**



50 minutes later  
**11:20, 12:10**



27 minutes later  
**6:13, 6:40**



6 minutes later  
**7:56, 8:02**



34 minutes later  
**2:07, 2:41**



# MORE PRACTICE

**Set 34** pages 92-93 Use the calendar on page 92 for each exercise. Name the day of the week for each date.

1. July 27  
Friday
2. September 26  
Wednesday
3. March 20  
Tuesday
4. November 11  
Sunday
5. August 10  
Friday
6. May 26  
Saturday

Name the date for each day.

7. Third Saturday in April  
April 21
8. Fifth Wednesday in May  
May 30
9. One week from December 6  
December 13
10. Three weeks from February 2  
February 23
11. Second Friday in October  
October 12
12. First Sunday in June  
June 3

Choose the most sensible answer.

13. Jane spends 7 (minutes, hours, days) in school each day.  
Hours
14. There are about 30 (hours, days, weeks) in a month.  
Days

**Set 35** pages 94-95 Estimate each length to the nearest centimeter. Then measure it.

1. \_\_\_\_\_  
11 cm
2. \_\_\_\_\_  
4 cm
3. \_\_\_\_\_  
13 cm

Tell if the measure is sensible. Write yes or no.

4. A pencil is about 17 cm long.  
Yes
5. An album cover is about 3 cm wide.  
No
6. A door is about 9 dm wide.  
Yes
7. A tennis racket is about 7 dm long.  
Yes
8. A baby is about 4 cm long.  
No
9. A paper clip is about 4 cm long.  
Yes

**Set 36** pages 96-97 Would you use centimeters, meters, or kilometers to measure

1. the distance a ball can be thrown?  
Meters
2. the width of a piece of notebook paper?  
Centimeters
3. the length of a swimming pool?  
Meters
4. the distance from Chicago to Atlanta?  
Kilometers
5. the length of a pen?  
Centimeters
6. the distance you can walk in 3 hours?  
Kilometers

Choose the most sensible measure.

7. Height of a pineapple  
2 cm    2 dm    2 km  
2 dm
8. Distance run in a race  
5 cm    5 m    5 km  
5 km
9. Height of the mailman  
2 cm    2 m    2 km  
2 m
10. Thickness of a magazine  
1 cm    1 m    1 km  
1 cm



**Set 37** pages 98–99 Would you use grams or kilograms to measure the weight of

1. a lawn mower?  
**Kilograms**
3. a pocket calculator?  
**Grams**
5. a tomato?  
**Grams**
2. a car?  
**Kilograms**
4. a postcard?  
**Grams**
6. a bookcase?  
**Kilograms**

Choose the more sensible measure.

7. Baseball bat  
850 g    850 kg  
**850 g**
9. Dictionary  
2 g    2 kg  
**2 kg**
8. Flashlight  
200 g    200 kg  
**200 g**
10. Sunglasses  
65 g    65 kg  
**65 g**

**Set 38** pages 100–101 Would you use milliliters or liters to measure the amount of liquid in

1. a cereal bowl?  
**Milliliters**
3. a horse trough?  
**Liters**
5. a sponge?  
**Milliliters**
2. a test tube?  
**Milliliters**
4. an eye dropper?  
**Milliliters**
6. a sink?  
**Liters**

Choose the more sensible measure.

7. Baby bottle  
200 mL    200 L  
**200 mL**
9. Washing machine  
60 mL    60 L  
**60 L**
8. Soup ladle  
125 mL    125 L  
**125 mL**
10. Watering can  
4 mL    4 L  
**4 L**

**Set 39** pages 104–105 Solve each problem. Use the map on page 104.

1. Is the actual distance from the lookout point to the pond less than or greater than the actual distance from the landing to the pond?  
**Greater than**
3. Choose the most sensible estimate for the actual distance from the snake pit to the landing.  
8 km    12 km    20 km  
**8 km**
2. Is the actual distance from the snake pit to the quicksand less than or greater than the actual distance from the quicksand to the buried treasure?  
**Less than**
4. Choose the most sensible estimate for the actual distance from the quicksand to the cave.  
15 km    30 km    40 km  
**30 km**



# MORE PRACTICE

**Set 40** pages 106–107 Estimate each length to the nearest inch. Then measure it.

1. \_\_\_\_\_  
3 in.
2. \_\_\_\_\_  
2 in.
3. \_\_\_\_\_  
6 in.

Tell if each measure is sensible. Write yes or no.

- |  |   |
|--|---|
| 4. A fishing pole is about 4 feet long.<br>Yes | 5. A key is about 2 inches long.<br>Yes |
| 6. A bedroom is about 13 feet wide.<br>Yes     | 7. A table is about 30 feet tall.<br>No |

**Set 41** pages 108–109 Which unit would you use to measure the

- |  |  |
|--|--|
| 1. height of a fence?<br>(feet or miles)<br>Feet             | 2. length of a garden?<br>(yards or miles)<br>Yards      |
| 3. distance of a bicycle race?<br>(inches or miles)<br>Miles | 4. width of a photograph?<br>(inches or yards)<br>Inches |

Choose the most sensible measure.

- |   |  |
|---|--|
| 5. Length of your little finger<br>2 in.    2 ft.    2 mi.<br>2 in. | 6. Length of a swimming pool<br>25 in.    25 yd.    25 mi.<br>25 yd. |
| 7. Height of a door<br>7 in.    7 ft.    7 yd.<br>7 ft.             | 8. Width of a newspaper<br>14 in.    14 ft.    14 yd.<br>14 in.      |

**Set 42** pages 110–111 Would you use ounces, pounds, or tons to measure the weight of

- |                          |                              |                            |
|--------------------------|------------------------------|----------------------------|
| 1. a turkey?<br>Pounds   | 2. a van?<br>Tons            | 3. a tomato?<br>Ounces     |
| 4. a necklace?<br>Ounces | 5. a bowling ball?<br>Pounds | 6. an ocean liner?<br>Tons |

Choose the most sensible measure.

- |  |   |
|--|---|
| 7. Toaster<br>4 ounces    4 pounds    4 tons<br>4 pounds     | 8. Piano<br>1 ounce    1 pound    1 ton<br>1 ton            |
| 9. Bicycle<br>30 ounces    30 pounds    30 tons<br>30 pounds | 10. Lightbulb<br>2 ounces    2 pounds    2 tons<br>2 ounces |



**Set 43** pages 112-113 Choose the unit you would use to measure the amount of liquid in

1. a soup ladle.  
(cup or quart)  
**Cup**
2. a fish tank.  
(pint or gallon)  
**Gallon**
3. a teapot.  
(pint or gallon)  
**Pint**

Choose the more sensible measure.

4. Birdbath  
3 cups    3 gallons  
**3 gallons**
5. Bucket  
6 cups    6 quarts  
**6 quarts**
6. Bathtub  
15 cups    15 gallons  
**15 gallons**




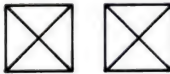

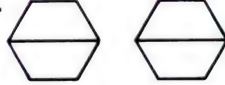
**Set 44** pages 116-117 Choose the more sensible measure. Use the thermometers on page 116 to help you.

1. Temperature inside a refrigerator  
45°F    100°F  
**45°F**
2. Temperature during a heat wave  
40°F    98°F  
**98°F**
3. Temperature of warm bathtub water  
40°C    90°C  
**40°C**
4. Picnic weather  
-10°C    25°C  
**25°C**

Give the more sensible measure. Use C (Celsius) or F (Fahrenheit).

5. Jason is raking leaves. The temperature is 10°  
**C**
6. Kristen is swimming in her pool. The temperature of the water is 72°  
**F**
7. Zachary went to the shopping mall. The temperature in the mall is 20°  
**C**
8. Beatrice is skiing. The temperature is 20°  
**F**

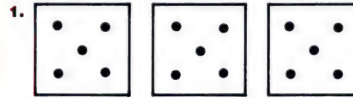
**Set 45** pages 122-123 Copy and complete each sentence.

1.   
 $3 + 3 + 3 + 3 = \text{■} \text{ 12}$   
 $4 \times 3 = \text{■} \text{ 12}$
2.   
 $2 + 2 + 2 + 2 + 2 = \text{■} \text{ 10}$   
 $5 \times 2 = \text{■} \text{ 10}$
3.   
 $3 + 3 = \text{■} \text{ 6}$   
 $2 \times 3 = \text{■} \text{ 6}$
4.   
 $4 + 4 = \text{■} \text{ 8}$   
 $2 \times 4 = \text{■} \text{ 8}$
5.   
 $4 + 4 + 4 + 4 + 4 = \text{■} \text{ 20}$   
 $5 \times 4 = \text{■} \text{ 20}$
6.   
 $2 + 2 = \text{■} \text{ 4}$   
 $2 \times 2 = \text{■} \text{ 4}$



# MORE PRACTICE

**Set 46** pages 124–125 Copy and complete the multiplication sentence for each picture.



$$3 \times 5 = \underline{\quad 15 \quad}$$



- |                               |                               |                               |                               |                               |                              |                               |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|-------------------------------|
| 3. $3 \times 2$<br><u>6</u>   | 4. $6 \times 2$<br><u>12</u>  | 5. $2 \times 9$<br><u>18</u>  | 6. $7 \times 3$<br><u>21</u>  | 7. $3 \times 6$<br><u>18</u>  | 8. $5 \times 2$<br><u>10</u> | 9. $3 \times 8$<br><u>24</u>  |
| 10. $3 \times 4$<br><u>12</u> | 11. $7 \times 2$<br><u>14</u> | 12. $6 \times 3$<br><u>18</u> | 13. $3 \times 5$<br><u>15</u> | 14. $2 \times 2$<br><u>4</u>  | 15. $2 \times 4$<br><u>8</u> | 16. $4 \times 3$<br><u>12</u> |
| 17. $3 \times 3$<br><u>9</u>  | 18. $8 \times 2$<br><u>16</u> | 19. $2 \times 6$<br><u>12</u> | 20. $9 \times 2$<br><u>18</u> | 21. $3 \times 9$<br><u>27</u> | 22. $4 \times 2$<br><u>8</u> | 23. $8 \times 3$<br><u>24</u> |

**Set 47** pages 126–127

- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1. $\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$<br><u>12</u>  | 2. $\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$<br><u>36</u>  | 3. $\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$<br><u>30</u>  | 4. $\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$<br><u>20</u>  | 5. $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$<br><u>35</u>  | 6. $\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$<br><u>12</u>  | 7. $\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$<br><u>27</u>  | 8. $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$<br><u>25</u>  | 9. $\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$<br><u>28</u>  |
| 10. $\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$<br><u>16</u> | 11. $\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$<br><u>40</u> | 12. $\begin{array}{r} 2 \\ \times 8 \\ \hline \end{array}$<br><u>16</u> | 13. $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$<br><u>32</u> | 14. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$<br><u>30</u> | 15. $\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$<br><u>36</u> | 16. $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$<br><u>28</u> | 17. $\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$<br><u>10</u> | 18. $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$<br><u>45</u> |
| 19. $\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$<br><u>15</u> | 20. $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$<br><u>24</u> | 21. $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$<br><u>20</u> | 22. $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$<br><u>15</u> | 23. $\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$<br><u>45</u> | 24. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$<br><u>24</u> | 25. $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$<br><u>20</u> | 26. $\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$<br><u>8</u>  | 27. $\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$<br><u>35</u> |
| 28. $4 \times 2$<br><u>8</u>  | 29. $2 \times 5$<br><u>10</u>   | 30. $8 \times 5$<br><u>40</u>   | 31. $2 \times 7$<br><u>14</u>   | 32. $4 \times 8$<br><u>32</u>   | 33. $2 \times 6$<br><u>12</u>   | 34. $8 \times 3$<br><u>24</u>   |   |   |

**Set 48** pages 128–129

- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1. $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$<br><u>18</u>  | 2. $\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$<br><u>42</u>  | 3. $\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$<br><u>12</u>  | 4. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$<br><u>24</u>  | 5. $\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$<br><u>54</u>  | 6. $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$<br><u>20</u>  | 7. $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$<br><u>36</u>  | 8. $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$<br><u>30</u>  | 9. $\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$<br><u>54</u>  |
| 10. $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$<br><u>42</u> | 11. $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$<br><u>48</u> | 12. $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$<br><u>32</u> | 13. $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$<br><u>12</u> | 14. $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$<br><u>24</u> | 15. $\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$<br><u>30</u> | 16. $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$<br><u>48</u> | 17. $\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$<br><u>14</u> | 18. $\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$<br><u>24</u> |
| 19. $\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$<br><u>54</u> | 20. $\begin{array}{r} 3 \\ \times 7 \\ \hline \end{array}$<br><u>21</u> | 21. $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$<br><u>36</u> | 22. $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$<br><u>18</u> | 23. $\begin{array}{r} 2 \\ \times 8 \\ \hline \end{array}$<br><u>16</u> | 24. $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$<br><u>48</u> | 25. $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$<br><u>35</u> | 26. $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$<br><u>48</u> | 27. $\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$<br><u>27</u> |
| 28. $8 \times 3$<br><u>24</u>   | 29. $2 \times 6$<br><u>12</u>   | 30. $4 \times 9$<br><u>36</u>   | 31. $7 \times 6$<br><u>42</u>   | 32. $9 \times 6$<br><u>54</u>   | 33. $4 \times 8$<br><u>32</u>   | 34. $6 \times 5$<br><u>30</u>   |   |   |



Set 49 pages 132-133

- |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
| 1. $\begin{array}{r} 6 \\ \times 0 \\ \hline 0 \end{array}$  | 2. $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$  | 3. $\begin{array}{r} 4 \\ \times 0 \\ \hline 0 \end{array}$  | 4. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$  | 5. $\begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array}$  | 6. $\begin{array}{r} 0 \\ \times 3 \\ \hline 0 \end{array}$  | 7. $\begin{array}{r} 9 \\ \times 0 \\ \hline 0 \end{array}$  | 8. $\begin{array}{r} 0 \\ \times 7 \\ \hline 0 \end{array}$  | 9. $\begin{array}{r} 0 \\ \times 1 \\ \hline 0 \end{array}$  |
| 10. $\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$ | 11. $\begin{array}{r} 3 \\ \times 0 \\ \hline 0 \end{array}$ | 12. $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$ | 13. $\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$ | 14. $\begin{array}{r} 0 \\ \times 0 \\ \hline 0 \end{array}$ | 15. $\begin{array}{r} 6 \\ \times 1 \\ \hline 6 \end{array}$ | 16. $\begin{array}{r} 1 \\ \times 2 \\ \hline 2 \end{array}$ | 17. $\begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array}$ | 18. $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$ |
| 19. $1 \times 3$<br>3  | 20. $7 \times 0$<br>0  | 21. $1 \times 0$<br>0  | 22. $9 \times 1$<br>9  | 23. $5 \times 0$<br>0  | 24. $0 \times 2$<br>0  | 25. $5 \times 1$<br>5  |  |  |

Set 50 pages 134-135

- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1. $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$  | 2. $\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$  | 3. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$  | 4. $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$  | 5. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$   | 6. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$  | 7. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$  | 8. $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$  | 9. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$  |
| 10. $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$ | 11. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$ | 12. $\begin{array}{r} 7 \\ \times 0 \\ \hline 0 \end{array}$  | 13. $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$ | 14. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$ | 15. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ | 16. $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$ | 17. $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$ | 18. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$ |
| 19. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$ | 20. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ | 21. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ | 22. $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$ | 23. $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$ | 24. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$ | 25. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$ | 26. $\begin{array}{r} 7 \\ \times 0 \\ \hline 0 \end{array}$  | 27. $\begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array}$  |
| 28. $7 \times 8$<br>56  | 29. $0 \times 4$<br>0   | 30. $7 \times 9$<br>63  | 31. $8 \times 6$<br>48  | 32. $7 \times 5$<br>35  | 33. $0 \times 7$<br>0   | 34. $9 \times 1$<br>9   |   |   |
| 35. $2 \times 7$<br>14  | 36. $3 \times 7$<br>21  | 37. $4 \times 9$<br>36  | 38. $5 \times 7$<br>35  | 39. $8 \times 7$<br>56  | 40. $0 \times 1$<br>0   | 41. $6 \times 7$<br>42  |   |   |

Set 51 pages 136-137

- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$  | 2. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$  | 3. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$  | 4. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$  | 5. $\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$   | 6. $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$  | 7. $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$  | 8. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$  | 9. $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$   |
| 10. $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$ | 11. $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$ | 12. $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$  | 13. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$ | 14. $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$ | 15. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ | 16. $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$  | 17. $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$ | 18. $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$ |
| 19. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ | 20. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$ | 21. $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$ | 22. $\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$ | 23. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$ | 24. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ | 25. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$ | 26. $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$ | 27. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$ |
| 28. $8 \times 7$<br>56  | 29. $2 \times 6$<br>12  | 30. $0 \times 8$<br>0   | 31. $2 \times 8$<br>16  | 32. $4 \times 8$<br>32  | 33. $8 \times 8$<br>64  | 34. $8 \times 1$<br>8   |   |   |
| 35. $0 \times 1$<br>0   | 36. $6 \times 8$<br>48  | 37. $9 \times 8$<br>72  | 38. $5 \times 6$<br>30  | 39. $8 \times 7$<br>56  | 40. $6 \times 3$<br>18  | 41. $8 \times 9$<br>72  |   |   |



Set 53

- John bought 2 boxes of pencils at \$1 each. What was the total cost of the pencils?
- Sue bought a box of pens for \$2 and a notebook for \$3. What was the total cost of these items?
- Alicia bought 2 notebooks at \$3 each. She paid \$10. How much change did she receive?
- Notebooks sell for \$3 each. Staplers sell for \$7 each. How much more does a stapler cost than a notebook?
- A box of pencils costs \$1. A box of pens costs \$2. Which costs more, a box of pencils or a box of pens?
- Staplers are on sale for \$0.50 off the regular price. If the regular price of a stapler is \$7, what is the sale price of a stapler?

# MORE PRACTICE

Set 52 pages 138-139

|   |   |   |   |   |  |   |   |   |
|---|---|---|---|---|--|---|---|---|
| 1. $\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$  | 2. $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$  | 3. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$  | 4. $\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$  | 5. $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$  | 6. $\begin{array}{r} 9 \\ \times 0 \\ \hline 0 \end{array}$  | 7. $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$  | 8. $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$  | 9. $\begin{array}{r} 0 \\ \times 1 \\ \hline 0 \end{array}$   |
| 10. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$ | 11. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$ | 12. $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$ | 13. $\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$ | 14. $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$ | 15. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$ | 16. $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$ | 17. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$ | 18. $\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$  |
| 19. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ | 20. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$ | 21. $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$  | 22. $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$ | 23. $\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$ | 24. $\begin{array}{r} 0 \\ \times 9 \\ \hline 0 \end{array}$ | 25. $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$ | 26. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$ | 27. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$ |
| 28. $9 \times 4$<br>36  | 29. $3 \times 7$<br>21  | 30. $7 \times 9$<br>63  | 31. $5 \times 8$<br>40  | 32. $2 \times 9$<br>18  | 33. $7 \times 8$<br>56                                       | 34. $9 \times 9$<br>81  |   |   |
| 35. $9 \times 1$<br>9   | 36. $8 \times 9$<br>72  | 37. $9 \times 5$<br>45  | 38. $6 \times 4$<br>24  | 39. $9 \times 6$<br>54  | 40. $6 \times 6$<br>36                                       | 41. $3 \times 9$<br>27  |   |   |

Set 53 pages 142-143



Write a problem about

Answers will vary. See margin for samples.

- buying 2 boxes of pencils.
- buying a box of pens and a notebook.
- the change received from \$10 when buying 2 notebooks.
- how much more one item costs than another.
- which of two items costs more.
- the sale price of an item when it is \$0.50 off the regular price.

Set 54 pages 148-149

|                                |                                |                                 |                                |                                |
|--------------------------------|--------------------------------|---------------------------------|--------------------------------|--------------------------------|
| 1. $6 \times 1$<br>6           | 2. $6 \times 10$<br>60         | 3. $6 \times 100$<br>600        | 4. $6 \times 1,000$<br>6,000   | 5. $9 \times 1,000$<br>9,000   |
| 6. $4 \times 100$<br>400       | 7. $3 \times 10$<br>30         | 8. $5 \times 10$<br>50          | 9. $5 \times 100$<br>500       | 10. $5 \times 1,000$<br>5,000  |
| 11. $4 \times 6$<br>24         | 12. $4 \times 60$<br>240       | 13. $4 \times 600$<br>2,400     | 14. $4 \times 6,000$<br>24,000 | 15. $24 \times 10$<br>240      |
| 16. $7 \times 10$<br>70        | 17. $7 \times 20$<br>140       | 18. $7 \times 30$<br>210        | 19. $7 \times 200$<br>1,400    | 20. $7 \times 3,000$<br>21,000 |
| 21. $3 \times 200$<br>600      | 22. $3 \times 300$<br>900      | 23. $3 \times 4,000$<br>12,000  | 24. $3 \times 500$<br>1,500    | 25. $3 \times 2,000$<br>6,000  |
| 26. $4,000 \times 8$<br>32,000 | 27. $10 \times 100$<br>1,000   | 28. $14 \times 1,000$<br>14,000 | 29. $7 \times 100$<br>700      | 30. $200 \times 6$<br>1,200    |
| 31. $100 \times 100$<br>10,000 | 32. $5,000 \times 6$<br>30,000 | 33. $36 \times 10$<br>360       | 34. $16 \times 100$<br>1,600   | 35. $7 \times 8,000$<br>56,000 |



Set 55 pages 150-151

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 43 \\ \times 2 \\ \hline 86 \end{array}$         | 2. $\begin{array}{r} 21 \\ \times 4 \\ \hline 84 \end{array}$         | 3. $\begin{array}{r} 33 \\ \times 3 \\ \hline 99 \end{array}$         | 4. $\begin{array}{r} 13 \\ \times 2 \\ \hline 26 \end{array}$         | 5. $\begin{array}{r} 70 \\ \times 3 \\ \hline 210 \end{array}$        | 6. $\begin{array}{r} 61 \\ \times 4 \\ \hline 244 \end{array}$        |
| 7. $\begin{array}{r} 51 \\ \times 8 \\ \hline 408 \end{array}$        | 8. $\begin{array}{r} 90 \\ \times 6 \\ \hline 540 \end{array}$        | 9. $\begin{array}{r} 214 \\ \times 2 \\ \hline 428 \end{array}$       | 10. $\begin{array}{r} 322 \\ \times 3 \\ \hline 966 \end{array}$      | 11. $\begin{array}{r} 121 \\ \times 3 \\ \hline 363 \end{array}$      | 12. $\begin{array}{r} 104 \\ \times 2 \\ \hline 208 \end{array}$      |
| 13. $\begin{array}{r} 403 \\ \times 2 \\ \hline 806 \end{array}$      | 14. $\begin{array}{r} 501 \\ \times 6 \\ \hline 3,006 \end{array}$    | 15. $\begin{array}{r} 210 \\ \times 9 \\ \hline 1,890 \end{array}$    | 16. $\begin{array}{r} 823 \\ \times 3 \\ \hline 2,469 \end{array}$    | 17. $\begin{array}{r} 411 \\ \times 8 \\ \hline 3,288 \end{array}$    | 18. $\begin{array}{r} 603 \\ \times 3 \\ \hline 1,809 \end{array}$    |
| 19. $\begin{array}{r} 2,102 \\ \times 4 \\ \hline 8,408 \end{array}$  | 20. $\begin{array}{r} 5,233 \\ \times 3 \\ \hline 15,699 \end{array}$ | 21. $\begin{array}{r} 6,203 \\ \times 3 \\ \hline 18,609 \end{array}$ | 22. $\begin{array}{r} 8,434 \\ \times 2 \\ \hline 16,868 \end{array}$ | 23. $\begin{array}{r} 7,021 \\ \times 4 \\ \hline 28,084 \end{array}$ | 24. $\begin{array}{r} 6,224 \\ \times 2 \\ \hline 12,448 \end{array}$ |
| 25. $\begin{array}{r} 4,323 \\ \times 3 \\ \hline 12,969 \end{array}$ | 26. $\begin{array}{r} 9,114 \\ \times 2 \\ \hline 18,228 \end{array}$ | 27. $\begin{array}{r} 5,214 \\ \times 2 \\ \hline 10,428 \end{array}$ | 28. $\begin{array}{r} 8,003 \\ \times 3 \\ \hline 24,009 \end{array}$ | 29. $\begin{array}{r} 7,022 \\ \times 4 \\ \hline 28,088 \end{array}$ | 30. $\begin{array}{r} 6,324 \\ \times 2 \\ \hline 12,648 \end{array}$ |

Set 56 pages 152-153

- |   |   |   |   |   |  |
|---|---|---|---|---|--|
| 1. $\begin{array}{r} 16 \\ \times 7 \\ \hline 112 \end{array}$        | 2. $\begin{array}{r} 48 \\ \times 3 \\ \hline 144 \end{array}$        | 3. $\begin{array}{r} 45 \\ \times 2 \\ \hline 90 \end{array}$         | 4. $\begin{array}{r} 26 \\ \times 8 \\ \hline 208 \end{array}$        | 5. $\begin{array}{r} 73 \\ \times 6 \\ \hline 438 \end{array}$        | 6. $\begin{array}{r} 54 \\ \times 4 \\ \hline 216 \end{array}$       |
| 7. $\begin{array}{r} 59 \\ \times 3 \\ \hline 177 \end{array}$        | 8. $\begin{array}{r} 63 \\ \times 7 \\ \hline 441 \end{array}$        | 9. $\begin{array}{r} 28 \\ \times 3 \\ \hline 84 \end{array}$         | 10. $\begin{array}{r} 78 \\ \times 5 \\ \hline 390 \end{array}$       | 11. $\begin{array}{r} 34 \\ \times 7 \\ \hline 238 \end{array}$       | 12. $\begin{array}{r} 66 \\ \times 9 \\ \hline 594 \end{array}$      |
| 13. $\begin{array}{r} 472 \\ \times 4 \\ \hline 1,888 \end{array}$    | 14. $\begin{array}{r} 326 \\ \times 3 \\ \hline 978 \end{array}$      | 15. $\begin{array}{r} 164 \\ \times 2 \\ \hline 328 \end{array}$      | 16. $\begin{array}{r} 371 \\ \times 5 \\ \hline 1,855 \end{array}$    | 17. $\begin{array}{r} 517 \\ \times 5 \\ \hline 2,585 \end{array}$    | 18. $\begin{array}{r} 214 \\ \times 5 \\ \hline 1,070 \end{array}$   |
| 19. $\begin{array}{r} 151 \\ \times 6 \\ \hline 906 \end{array}$      | 20. $\begin{array}{r} 238 \\ \times 2 \\ \hline 476 \end{array}$      | 21. $\begin{array}{r} 960 \\ \times 8 \\ \hline 7,680 \end{array}$    | 22. $\begin{array}{r} 417 \\ \times 5 \\ \hline 2,085 \end{array}$    | 23. $\begin{array}{r} 831 \\ \times 8 \\ \hline 6,648 \end{array}$    | 24. $\begin{array}{r} 919 \\ \times 3 \\ \hline 2,757 \end{array}$   |
| 25. $\begin{array}{r} 3,602 \\ \times 4 \\ \hline 14,408 \end{array}$ | 26. $\begin{array}{r} 5,117 \\ \times 5 \\ \hline 25,585 \end{array}$ | 27. $\begin{array}{r} 3,016 \\ \times 4 \\ \hline 12,064 \end{array}$ | 28. $\begin{array}{r} 4,421 \\ \times 4 \\ \hline 17,684 \end{array}$ | 29. $\begin{array}{r} 7,392 \\ \times 2 \\ \hline 14,784 \end{array}$ | 30. $\begin{array}{r} 1,019 \\ \times 4 \\ \hline 4,076 \end{array}$ |
| 31. $37 \times 5$<br>185  | 32. $74 \times 3$<br>222  | 33. $9 \times 65$<br>585  | 34. $872 \times 2$<br>1,744   | 35. $551 \times 6$<br>3,306   |  |
| 36. $4 \times 419$<br>1,676   | 37. $325 \times 2$<br>650   | 38. $5,160 \times 3$<br>15,480  | 39. $7 \times 6,012$<br>42,084  | 40. $2,352 \times 2$<br>4,704   |  |
| 41. $85 \times 7$<br>595  | 42. $29 \times 6$<br>174  | 43. $617 \times 4$<br>2,468   | 44. $572 \times 4$<br>2,288   | 45. $8,411 \times 8$<br>67,288  |  |



# MORE PRACTICE

**Set 57** pages 154–155 Solve each problem.

In the products for the factor 6, what pattern is made by

- the ones digit?  
**6, 2, 8, 4, 0**
- the sums of the digits? If there is a 2-digit sum, add again to get a 1-digit sum.  
**6, 3, 9**

In the products for the factor 8, what pattern is made by

- the ones digit?  
**8, 6, 4, 2, 0**
- the sums of the digits? If there is a 2-digit sum, add again to get a 1-digit sum.  
**8, 7, 6, 5, 4, 3, 2, 1, 9**

**Set 58** pages 156–157

- |  |   |  |  |  |  |
|--|---|--|--|--|--|
| 1. $\begin{array}{r} 164 \\ \times 3 \\ \hline 492 \end{array}$      | 2. $\begin{array}{r} 287 \\ \times 3 \\ \hline 861 \end{array}$       | 3. $\begin{array}{r} 294 \\ \times 5 \\ \hline 1,470 \end{array}$    | 4. $\begin{array}{r} 526 \\ \times 8 \\ \hline 4,208 \end{array}$    | 5. $\begin{array}{r} 718 \\ \times 9 \\ \hline 6,462 \end{array}$    | 6. $\begin{array}{r} 443 \\ \times 6 \\ \hline 2,658 \end{array}$    |
| 7. $\begin{array}{r} 652 \\ \times 7 \\ \hline 4,564 \end{array}$    | 8. $\begin{array}{r} 356 \\ \times 4 \\ \hline 1,424 \end{array}$     | 9. $\begin{array}{r} 789 \\ \times 2 \\ \hline 1,578 \end{array}$    | 10. $\begin{array}{r} 486 \\ \times 3 \\ \hline 1,458 \end{array}$   | 11. $\begin{array}{r} 2,184 \\ \times 4 \\ \hline 8,736 \end{array}$ | 12. $\begin{array}{r} 1,316 \\ \times 5 \\ \hline 6,580 \end{array}$ |
| 13. $\begin{array}{r} 3,761 \\ \times 2 \\ \hline 7,522 \end{array}$ | 14. $\begin{array}{r} 4,123 \\ \times 7 \\ \hline 28,861 \end{array}$ | 15. $\begin{array}{r} 1,615 \\ \times 4 \\ \hline 6,460 \end{array}$ | 16. $\begin{array}{r} 1,827 \\ \times 2 \\ \hline 3,654 \end{array}$ | 17. $\begin{array}{r} 2,360 \\ \times 4 \\ \hline 9,440 \end{array}$ | 18. $\begin{array}{r} 1,918 \\ \times 3 \\ \hline 5,754 \end{array}$ |
| 19. $354 \times 6$<br><b>2,124</b>                                   | 20. $572 \times 5$<br><b>2,860</b>                                    | 21. $168 \times 3$<br><b>504</b>                                     | 22. $227 \times 7$<br><b>1,589</b>                                   | 23. $418 \times 9$<br><b>3,762</b>                                   |  |
| 24. $7 \times 1,371$<br><b>9,597</b>                                 | 25. $2,154 \times 6$<br><b>12,924</b>                                 | 26. $3,264 \times 3$<br><b>9,792</b>                                 | 27. $5 \times 1,716$<br><b>8,580</b>                                 | 28. $3 \times 3,460$<br><b>10,380</b>                                |  |

**Set 59** pages 158–159

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. $\begin{array}{r} 703 \\ \times 3 \\ \hline 2,109 \end{array}$     | 2. $\begin{array}{r} 450 \\ \times 5 \\ \hline 2,250 \end{array}$     | 3. $\begin{array}{r} 602 \\ \times 7 \\ \hline 4,214 \end{array}$     | 4. $\begin{array}{r} 104 \\ \times 9 \\ \hline 936 \end{array}$       | 5. $\begin{array}{r} 230 \\ \times 6 \\ \hline 1,380 \end{array}$     | 6. $\begin{array}{r} 405 \\ \times 6 \\ \hline 2,430 \end{array}$     |
| 7. $\begin{array}{r} 500 \\ \times 4 \\ \hline 2,000 \end{array}$     | 8. $\begin{array}{r} 301 \\ \times 9 \\ \hline 2,709 \end{array}$     | 9. $\begin{array}{r} 270 \\ \times 2 \\ \hline 540 \end{array}$       | 10. $\begin{array}{r} 603 \\ \times 4 \\ \hline 2,412 \end{array}$    | 11. $\begin{array}{r} 7,080 \\ \times 6 \\ \hline 42,480 \end{array}$ | 12. $\begin{array}{r} 2,008 \\ \times 4 \\ \hline 8,032 \end{array}$  |
| 13. $\begin{array}{r} 4,042 \\ \times 6 \\ \hline 24,252 \end{array}$ | 14. $\begin{array}{r} 1,034 \\ \times 5 \\ \hline 5,170 \end{array}$  | 15. $\begin{array}{r} 2,602 \\ \times 6 \\ \hline 15,612 \end{array}$ | 16. $\begin{array}{r} 3,120 \\ \times 6 \\ \hline 18,720 \end{array}$ | 17. $\begin{array}{r} 5,009 \\ \times 9 \\ \hline 45,081 \end{array}$ | 18. $\begin{array}{r} 8,012 \\ \times 9 \\ \hline 72,108 \end{array}$ |
| 19. $\begin{array}{r} 5,063 \\ \times 4 \\ \hline 20,252 \end{array}$ | 20. $\begin{array}{r} 3,402 \\ \times 6 \\ \hline 20,412 \end{array}$ | 21. $\begin{array}{r} 1,090 \\ \times 2 \\ \hline 2,180 \end{array}$  | 22. $\begin{array}{r} 2,009 \\ \times 5 \\ \hline 10,045 \end{array}$ | 23. $\begin{array}{r} 4,013 \\ \times 4 \\ \hline 16,052 \end{array}$ | 24. $\begin{array}{r} 6,070 \\ \times 7 \\ \hline 42,490 \end{array}$ |

**372**



**Set 60** pages 162-163

- |                          |                             |                                 |                               |                               |                                |
|--------------------------|-----------------------------|---------------------------------|-------------------------------|-------------------------------|--------------------------------|
| 1. $4 \times 70$<br>280  | 2. $20 \times 80$<br>1,600  | 3. $400 \times 30$<br>12,000    | 4. $20 \times 600$<br>12,000  | 5. $60 \times 600$<br>36,000  | 6. $300 \times 70$<br>21,000   |
| 7. $3 \times 20$<br>60   | 8. $30 \times 30$<br>900    | 9. $600 \times 40$<br>24,000    | 10. $4 \times 500$<br>2,000   | 11. $5 \times 700$<br>3,500   | 12. $6 \times 9,000$<br>54,000 |
| 13. $60 \times 5$<br>300 | 14. $70 \times 40$<br>2,800 | 15. $900 \times 70$<br>63,000   | 16. $2 \times 900$<br>1,800   | 17. $30 \times 600$<br>18,000 | 18. $40 \times 80$<br>3,200    |
| 19. $90 \times 7$<br>630 | 20. $50 \times 10$<br>500   | 21. $300 \times 50$<br>15,000   | 22. $7 \times 600$<br>4,200   | 23. $9 \times 400$<br>3,600   | 24. $700 \times 4$<br>2,800    |
| 25. $50 \times 2$<br>100 | 26. $90 \times 30$<br>2,700 | 27. $6 \times 900$<br>5,400     | 28. $20 \times 800$<br>16,000 | 29. $50 \times 50$<br>2,500   | 30. $300 \times 30$<br>9,000   |
| 31. $70 \times 6$<br>420 | 32. $20 \times 80$<br>1,600 | 33. $30 \times 2,000$<br>60,000 | 34. $40 \times 200$<br>8,000  | 35. $300 \times 90$<br>27,000 | 36. $70 \times 700$<br>49,000  |

**Set 61** pages 164-165 Estimate each product.

- |                          |                          |                          |                             |                             |                             |
|--------------------------|--------------------------|--------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1. $71 \times 3$<br>210  | 2. $8 \times 38$<br>320  | 3. $9 \times 22$<br>180  | 4. $18 \times 84$<br>1,600  | 5. $46 \times 29$<br>1,500  | 6. $28 \times 59$<br>1,800  |
| 7. $64 \times 6$<br>360  | 8. $19 \times 3$<br>60   | 9. $4 \times 87$<br>360  | 10. $39 \times 43$<br>1,600 | 11. $31 \times 81$<br>2,400 | 12. $52 \times 64$<br>3,000 |
| 13. $92 \times 4$<br>360 | 14. $6 \times 42$<br>240 | 15. $62 \times 2$<br>120 | 16. $42 \times 91$<br>3,600 | 17. $16 \times 61$<br>1,200 | 18. $68 \times 38$<br>2,800 |
| 19. $8 \times 26$<br>240 | 20. $9 \times 51$<br>450 | 21. $3 \times 16$<br>60  | 22. $61 \times 35$<br>2,400 | 23. $58 \times 45$<br>3,000 | 24. $12 \times 76$<br>800   |
| 25. $7 \times 32$<br>210 | 26. $29 \times 4$<br>120 | 27. $34 \times 6$<br>180 | 28. $23 \times 32$<br>600   | 29. $33 \times 96$<br>3,000 | 30. $71 \times 23$<br>1,400 |
| 31. $5 \times 16$<br>100 | 32. $63 \times 2$<br>120 | 33. $56 \times 7$<br>420 | 34. $74 \times 22$<br>1,400 | 35. $85 \times 56$<br>5,400 | 36. $49 \times 78$<br>4,000 |

**Set 62** pages 166-167

- |   |  |  |  |   |  |  |  |
|---|--|--|--|---|--|--|--|
| 1. $\begin{array}{r} 24 \\ \times 30 \\ \hline 720 \end{array}$   | 2. $\begin{array}{r} 46 \\ \times 20 \\ \hline 920 \end{array}$    | 3. $\begin{array}{r} 53 \\ \times 60 \\ \hline 3,180 \end{array}$  | 4. $\begin{array}{r} 16 \\ \times 90 \\ \hline 1,440 \end{array}$  | 5. $\begin{array}{r} 82 \\ \times 20 \\ \hline 1,640 \end{array}$ | 6. $\begin{array}{r} 73 \\ \times 40 \\ \hline 2,920 \end{array}$  | 7. $\begin{array}{r} 29 \\ \times 20 \\ \hline 580 \end{array}$    | 8. $\begin{array}{r} 67 \\ \times 70 \\ \hline 4,690 \end{array}$  |
| 9. $\begin{array}{r} 35 \\ \times 50 \\ \hline 1,750 \end{array}$ | 10. $\begin{array}{r} 72 \\ \times 40 \\ \hline 2,880 \end{array}$ | 11. $\begin{array}{r} 63 \\ \times 20 \\ \hline 1,260 \end{array}$ | 12. $\begin{array}{r} 63 \\ \times 24 \\ \hline 1,512 \end{array}$ | 13. $\begin{array}{r} 24 \\ \times 40 \\ \hline 960 \end{array}$  | 14. $\begin{array}{r} 24 \\ \times 48 \\ \hline 1,152 \end{array}$ | 15. $\begin{array}{r} 52 \\ \times 30 \\ \hline 1,560 \end{array}$ | 16. $\begin{array}{r} 52 \\ \times 33 \\ \hline 1,716 \end{array}$ |
| 17. $\begin{array}{r} 42 \\ \times 16 \\ \hline 672 \end{array}$  | 18. $\begin{array}{r} 23 \\ \times 36 \\ \hline 828 \end{array}$   | 19. $\begin{array}{r} 41 \\ \times 64 \\ \hline 2,624 \end{array}$ | 20. $\begin{array}{r} 27 \\ \times 81 \\ \hline 2,187 \end{array}$ | 21. $\begin{array}{r} 35 \\ \times 22 \\ \hline 770 \end{array}$  | 22. $\begin{array}{r} 83 \\ \times 19 \\ \hline 1,577 \end{array}$ | 23. $\begin{array}{r} 47 \\ \times 34 \\ \hline 1,598 \end{array}$ | 24. $\begin{array}{r} 82 \\ \times 96 \\ \hline 7,872 \end{array}$ |
| 25. $34 \times 12$<br>408   | 26. $42 \times 46$<br>1,932  | 27. $61 \times 35$<br>2,135  | 28. $83 \times 24$<br>1,992  | 29. $92 \times 38$<br>3,496                                       | 30. $67 \times 62$<br>4,154  |  |  |
| 31. $27 \times 19$<br>513   | 32. $49 \times 26$<br>1,274  | 33. $54 \times 31$<br>1,674  | 34. $74 \times 53$<br>3,922  | 35. $81 \times 94$<br>7,614                                       | 36. $29 \times 68$<br>1,972  |  |  |



# MORE PRACTICE

## Set 63 pages 168-169

- |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
| 1. $\begin{array}{r} 200 \\ \times 26 \\ \hline 5,200 \end{array}$   | 2. $\begin{array}{r} 600 \\ \times 45 \\ \hline 27,000 \end{array}$  | 3. $\begin{array}{r} 900 \\ \times 18 \\ \hline 16,200 \end{array}$  | 4. $\begin{array}{r} 316 \\ \times 30 \\ \hline 9,480 \end{array}$   | 5. $\begin{array}{r} 442 \\ \times 60 \\ \hline 26,520 \end{array}$  | 6. $\begin{array}{r} 571 \\ \times 20 \\ \hline 11,420 \end{array}$  | 7. $\begin{array}{r} 207 \\ \times 38 \\ \hline 7,866 \end{array}$   | 8. $\begin{array}{r} 603 \\ \times 57 \\ \hline 34,371 \end{array}$  |
| 9. $\begin{array}{r} 290 \\ \times 79 \\ \hline 22,910 \end{array}$  | 10. $\begin{array}{r} 410 \\ \times 32 \\ \hline 13,120 \end{array}$ | 11. $\begin{array}{r} 368 \\ \times 28 \\ \hline 10,304 \end{array}$ | 12. $\begin{array}{r} 219 \\ \times 33 \\ \hline 7,227 \end{array}$  | 13. $\begin{array}{r} 487 \\ \times 61 \\ \hline 29,707 \end{array}$ | 14. $\begin{array}{r} 703 \\ \times 89 \\ \hline 62,567 \end{array}$ | 15. $\begin{array}{r} 521 \\ \times 25 \\ \hline 13,025 \end{array}$ | 16. $\begin{array}{r} 839 \\ \times 32 \\ \hline 26,848 \end{array}$ |
| 17. $\begin{array}{r} 706 \\ \times 34 \\ \hline 24,004 \end{array}$ | 18. $\begin{array}{r} 139 \\ \times 45 \\ \hline 6,255 \end{array}$  | 19. $\begin{array}{r} 427 \\ \times 51 \\ \hline 21,777 \end{array}$ | 20. $\begin{array}{r} 818 \\ \times 26 \\ \hline 21,268 \end{array}$ | 21. $\begin{array}{r} 622 \\ \times 52 \\ \hline 32,344 \end{array}$ | 22. $\begin{array}{r} 574 \\ \times 43 \\ \hline 24,682 \end{array}$ | 23. $\begin{array}{r} 334 \\ \times 12 \\ \hline 4,008 \end{array}$  | 24. $\begin{array}{r} 901 \\ \times 29 \\ \hline 26,129 \end{array}$ |

## Set 64 pages 172-173

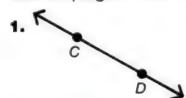
- |   |  |  |  |  |   |
|---|--|--|--|--|---|
| 1. $\begin{array}{r} \$0.06 \\ \times 7 \\ \hline \$0.42 \end{array}$   | 2. $\begin{array}{r} \$0.09 \\ \times 3 \\ \hline \$0.27 \end{array}$    | 3. $\begin{array}{r} \$0.06 \\ \times 8 \\ \hline \$0.48 \end{array}$    | 4. $\begin{array}{r} \$0.34 \\ \times 4 \\ \hline \$1.36 \end{array}$    | 5. $\begin{array}{r} \$0.23 \\ \times 5 \\ \hline \$1.15 \end{array}$    | 6. $\begin{array}{r} \$0.75 \\ \times 6 \\ \hline \$4.50 \end{array}$     |
| 7. $\begin{array}{r} \$1.55 \\ \times 3 \\ \hline \$4.65 \end{array}$   | 8. $\begin{array}{r} \$7.60 \\ \times 5 \\ \hline \$38.00 \end{array}$   | 9. $\begin{array}{r} \$8.35 \\ \times 4 \\ \hline \$33.40 \end{array}$   | 10. $\begin{array}{r} \$2.98 \\ \times 7 \\ \hline \$20.86 \end{array}$  | 11. $\begin{array}{r} \$4.00 \\ \times 6 \\ \hline \$24.00 \end{array}$  | 12. $\begin{array}{r} \$5.79 \\ \times 2 \\ \hline \$11.58 \end{array}$   |
| 13. $\begin{array}{r} \$0.29 \\ \times 15 \\ \hline \$4.35 \end{array}$ | 14. $\begin{array}{r} \$0.98 \\ \times 22 \\ \hline \$21.56 \end{array}$ | 15. $\begin{array}{r} \$0.45 \\ \times 42 \\ \hline \$18.90 \end{array}$ | 16. $\begin{array}{r} \$0.80 \\ \times 36 \\ \hline \$28.80 \end{array}$ | 17. $\begin{array}{r} \$2.95 \\ \times 21 \\ \hline \$61.95 \end{array}$ | 18. $\begin{array}{r} \$6.03 \\ \times 34 \\ \hline \$205.02 \end{array}$ |
| 19. $24 \times \$0.72$<br><b>\$17.28</b>                                | 20. $40 \times \$0.96$<br><b>\$38.40</b>                                 | 21. $12 \times \$1.59$<br><b>\$19.08</b>                                 | 22. $65 \times \$2.10$<br><b>\$136.50</b>                                | 23. $32 \times \$4.65$<br><b>\$148.80</b>                                |   |
| 24. $\$0.62 \times 2$<br><b>\$1.24</b>                                  | 25. $\$3.50 \times 8$<br><b>\$28.00</b>                                  | 26. $\$4.38 \times 12$<br><b>\$52.56</b>                                 | 27. $\$7.14 \times 18$<br><b>\$128.52</b>                                | 28. $\$1.98 \times 32$<br><b>\$63.36</b>                                 |   |

## Set 65 pages 174-175 Tell whether you add, subtract, or multiply. Then find the answer.

- |   |  |
|---|--|
| 1. Michiko practiced playing her clarinet 45 minutes each day. How many minutes did she practice in 5 days?<br><b>Multiply. 225 minutes</b>                 | 2. Jack was born in 1974. Jack's brother is 6 years older. In what year was Jack's brother born?<br><b>Subtract. 1968</b>                          |
| 3. Scott sold 263 tickets to the school play. Aurelio sold 174 tickets. How many tickets did they sell in all?<br><b>Add. 437 tickets</b>                   | 4. Tracy bought 3 balloons at the circus. The cost of each balloon was \$1.25. How much did she spend for the balloons?<br><b>Multiply. \$3.75</b> |
| 5. Erin bought two birthday presents. One present cost \$8.75. The other present cost \$7.50. How much did the presents cost in all?<br><b>Add. \$16.25</b> | 6. Last week 47 people bought bicycle tags. Each tag cost \$3.75. How much was spent on tags in all?<br><b>Multiply. \$176.25</b>                  |



**Set 66** pages 182-183 Name each segment or line.



Line CD

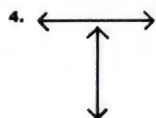


Line MN

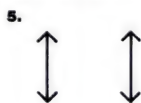


Segment JK

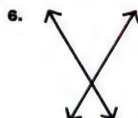
For each exercise, tell whether the lines are intersecting lines or parallel lines.



Intersecting lines



Parallel lines

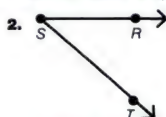


Intersecting lines

**Set 67** pages 184-185 Give two names for each angle.



Angle ABC, Angle CBA

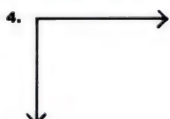


Angle TSR, Angle RST



Angle EDC, Angle CDE

Is each angle a right angle? Use a card to help you decide. Write yes or no.



Yes



No

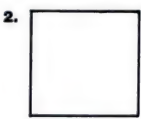


Yes

**Set 68** pages 186-187 Tell whether each figure is a polygon. Write yes or no.



No



Yes



No

For each polygon, write the number of sides and the number of angles.



4, 4



6, 6

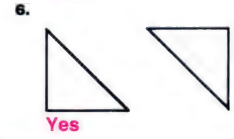
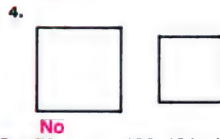
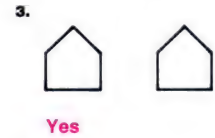


5, 5

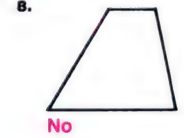
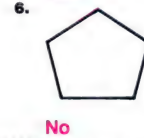
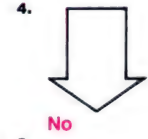
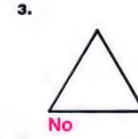
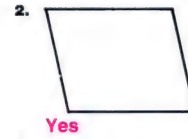


# MORE PRACTICE

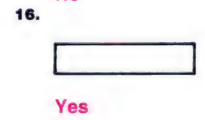
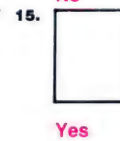
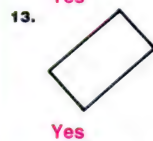
**Set 69** pages 188-189 Tell whether the segments or polygons are congruent. Write yes or no.



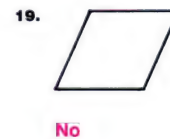
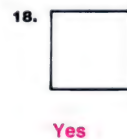
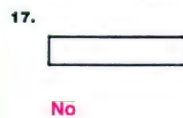
**Set 70** pages 190-191 Is each figure a parallelogram? Write yes or no.



Is each figure a rectangle? Write yes or no.

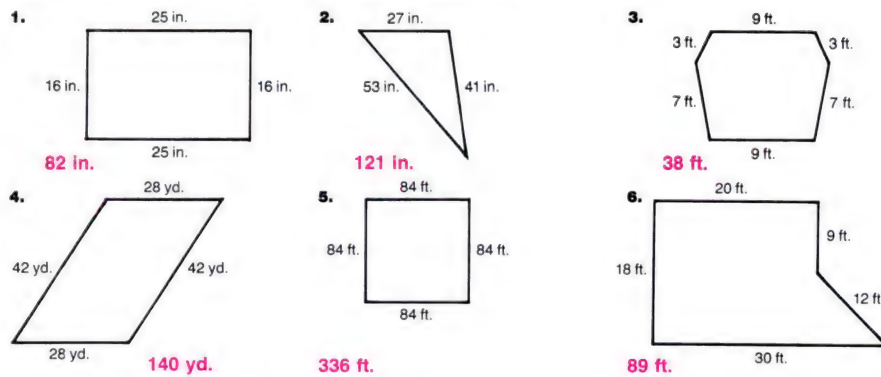


Is each figure a square? Write yes or no.

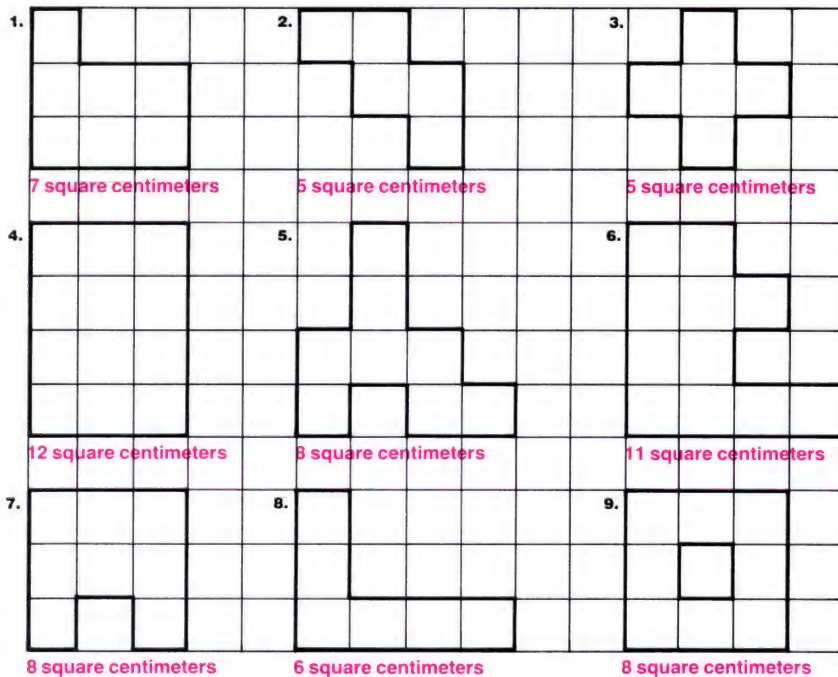




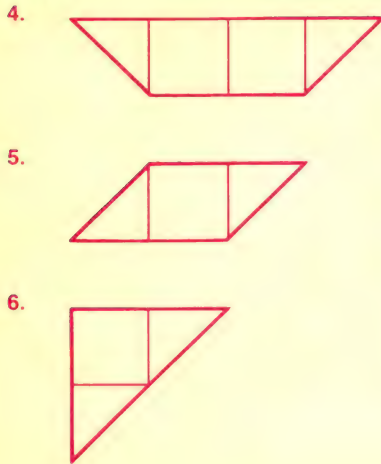
**Set 71** pages 192–193 Find the perimeter of each figure.



**Set 72** pages 194–195 Find the area of each figure in square centimeters.

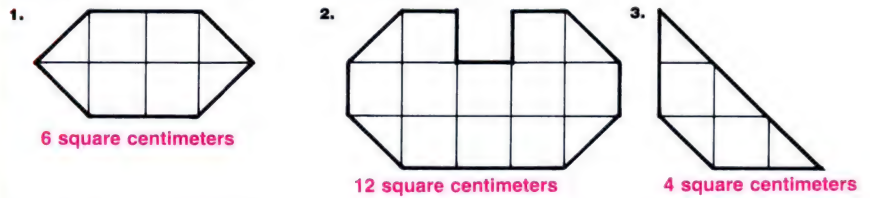




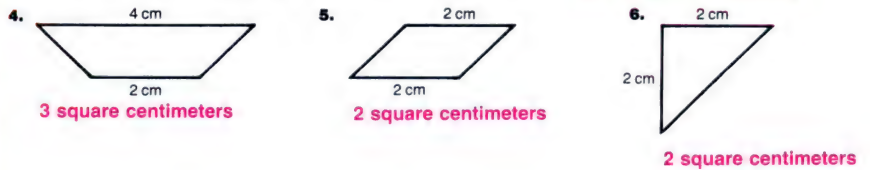


# MORE PRACTICE

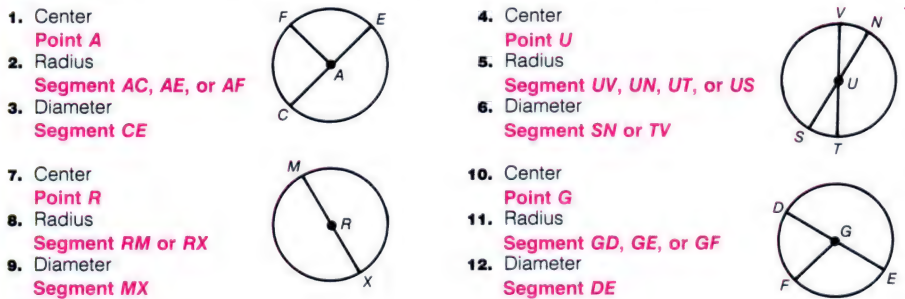
**Set 73** pages 198-199 Find the area of each figure.



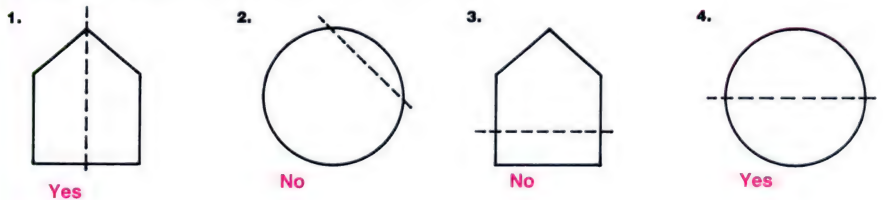
Trace each figure on centimeter grid paper. Then find the area. See margin for drawings.



**Set 74** pages 200-201 For each circle, name the center, a radius, and a diameter.

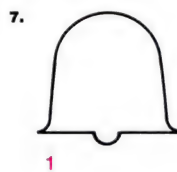
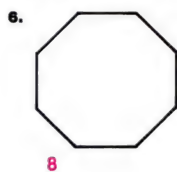
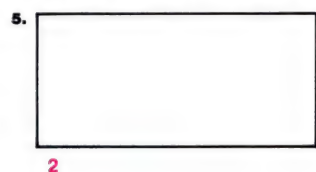


**Set 75** pages 202-203 Trace each figure and cut it out. Is the broken line a line of symmetry? Write yes or no.

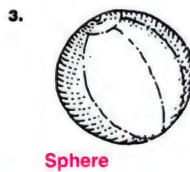




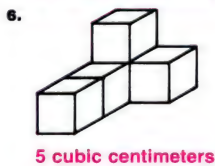
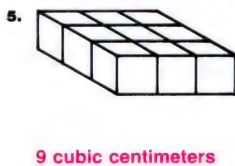
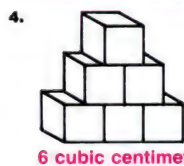
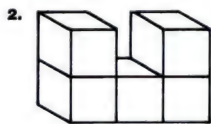
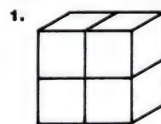
Trace each figure and cut it out. Tell how many lines of symmetry the figure has.



**Set 76** pages 204–205 Name the shape of each object. Use rectangular prism, cube, cylinder, cone, and sphere.



**Set 77** pages 206–207 Find the volume of each figure in cubic centimeters.

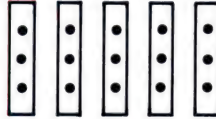




# MORE PRACTICE

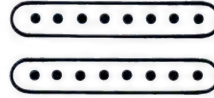
**Set 78** pages 212–213 Find how many groups. Then complete each division sentence.

1. 15 in all  
Groups of 3



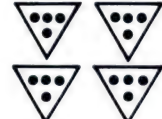
$$15 \div 3 = \underline{\quad 5 \quad}$$

2. 16 in all  
Groups of 8



$$16 \div 8 = \underline{\quad 2 \quad}$$

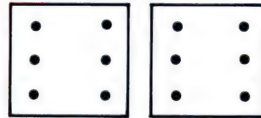
3. 16 in all  
Groups of 4



$$16 \div 4 = \underline{\quad 4 \quad}$$

Find how many in each group. Then complete each division sentence.

4. 12 in all  
2 equal groups



$$12 \div 2 = \underline{\quad 6 \quad}$$

5. 30 in all  
6 equal groups



$$30 \div 6 = \underline{\quad 5 \quad}$$

6. 9 in all  
3 equal groups



$$9 \div 3 = \underline{\quad 3 \quad}$$

**Set 79** pages 214–215

- |                             |                             |                             |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1. $8 \div 2$<br><u>4</u>   | 2. $9 \div 3$<br><u>3</u>   | 3. $18 \div 3$<br><u>6</u>  | 4. $4 \div 2$<br><u>2</u>   | 5. $10 \div 2$<br><u>5</u>  | 6. $6 \div 3$<br><u>2</u>   |
| 7. $12 \div 2$<br><u>6</u>  | 8. $24 \div 3$<br><u>8</u>  | 9. $18 \div 2$<br><u>9</u>  | 10. $21 \div 3$<br><u>7</u> | 11. $14 \div 2$<br><u>7</u> | 12. $15 \div 3$<br><u>5</u> |
| 13. $12 \div 3$<br><u>4</u> | 14. $16 \div 2$<br><u>8</u> | 15. $9 \div 3$<br><u>3</u>  | 16. $27 \div 3$<br><u>9</u> | 17. $16 \div 2$<br><u>8</u> | 18. $8 \div 2$<br><u>4</u>  |
| 19. $6 \div 2$<br><u>3</u>  | 20. $4 \div 2$<br><u>2</u>  | 21. $14 \div 2$<br><u>7</u> | 22. $12 \div 3$<br><u>4</u> | 23. $18 \div 2$<br><u>9</u> | 24. $18 \div 3$<br><u>6</u> |
| 25. $15 \div 3$<br><u>5</u> | 26. $12 \div 2$<br><u>6</u> | 27. $10 \div 2$<br><u>5</u> | 28. $24 \div 3$<br><u>8</u> | 29. $21 \div 3$<br><u>7</u> | 30. $27 \div 3$<br><u>9</u> |

**Set 80** pages 216–217

- |                                    |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $5 \overline{)15}$<br><u>3</u>  | 2. $4 \overline{)32}$<br><u>8</u>  | 3. $5 \overline{)25}$<br><u>5</u>  | 4. $4 \overline{)8}$<br><u>2</u>   | 5. $4 \overline{)28}$<br><u>7</u>  | 6. $5 \overline{)20}$<br><u>4</u>  |
| 7. $5 \overline{)40}$<br><u>8</u>  | 8. $4 \overline{)20}$<br><u>5</u>  | 9. $5 \overline{)10}$<br><u>2</u>  | 10. $4 \overline{)36}$<br><u>9</u> | 11. $4 \overline{)16}$<br><u>4</u> | 12. $5 \overline{)45}$<br><u>9</u> |
| 13. $4 \overline{)12}$<br><u>3</u> | 14. $5 \overline{)35}$<br><u>7</u> | 15. $3 \overline{)18}$<br><u>6</u> | 16. $4 \overline{)24}$<br><u>6</u> | 17. $5 \overline{)30}$<br><u>6</u> | 18. $2 \overline{)16}$<br><u>8</u> |
| 19. $10 \div 2$<br><u>5</u>        | 20. $24 \div 4$<br><u>6</u>        | 21. $24 \div 3$<br><u>8</u>        | 22. $25 \div 5$<br><u>5</u>        | 23. $28 \div 4$<br><u>7</u>        | 24. $14 \div 2$<br><u>7</u>        |
| 25. $6 \div 3$<br><u>2</u>         | 26. $15 \div 5$<br><u>3</u>        | 27. $40 \div 5$<br><u>8</u>        | 28. $8 \div 2$<br><u>4</u>         | 29. $45 \div 5$<br><u>9</u>        | 30. $36 \div 4$<br><u>9</u>        |



Set 81 pages 218-219

- |                                    |                                    |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $2 \div 1$<br>$\overset{2}{0}$  | 2. $2 \div 2$<br>$\overset{1}{0}$  | 3. $8 \div 1$<br>$\overset{8}{0}$  | 4. $0 \div 2$<br>$\overset{0}{0}$  | 5. $4 \div 1$<br>$\overset{4}{0}$  | 6. $0 \div 9$<br>$\overset{0}{0}$  | 7. $3 \div 3$<br>$\overset{1}{0}$  |
| 8. $0 \div 7$<br>$\overset{0}{0}$  | 9. $6 \div 6$<br>$\overset{1}{0}$  | 10. $7 \div 1$<br>$\overset{7}{0}$ | 11. $6 \div 1$<br>$\overset{6}{0}$ | 12. $0 \div 4$<br>$\overset{0}{0}$ | 13. $0 \div 1$<br>$\overset{0}{0}$ | 14. $8 \div 8$<br>$\overset{1}{0}$ |
| 15. $0 \div 1$<br>$\overset{0}{0}$ | 16. $5 \div 1$<br>$\overset{5}{0}$ | 17. $0 \div 8$<br>$\overset{0}{0}$ | 18. $7 \div 7$<br>$\overset{1}{0}$ | 19. $9 \div 1$<br>$\overset{9}{0}$ | 20. $1 \div 1$<br>$\overset{1}{0}$ | 21. $4 \div 4$<br>$\overset{1}{0}$ |
| 22. $0 \div 5$<br>$\overset{0}{0}$ | 23. $1 \div 1$<br>$\overset{1}{0}$ | 24. $6 \div 1$<br>$\overset{6}{0}$ | 25. $0 \div 6$<br>$\overset{0}{0}$ | 26. $0 \div 8$<br>$\overset{0}{0}$ | 27. $3 \div 1$<br>$\overset{3}{0}$ | 28. $9 \div 9$<br>$\overset{1}{0}$ |
| 29. $0 \div 3$<br>$\overset{0}{0}$ | 30. $5 \div 5$<br>$\overset{1}{0}$ | 31. $0 \div 4$<br>$\overset{0}{0}$ | 32. $3 \div 3$<br>$\overset{1}{0}$ | 33. $5 \div 1$<br>$\overset{5}{0}$ | 34. $0 \div 2$<br>$\overset{0}{0}$ | 35. $0 \div 7$<br>$\overset{0}{0}$ |

Set 82 pages 222-223

- |  |  |  |  |  |  |
|--|--|--|--|--|--|
| 1. $6 \overline{)18}$<br>$\overset{3}{0}$  | 2. $2 \overline{)8}$<br>$\overset{4}{0}$   | 3. $3 \overline{)24}$<br>$\overset{8}{0}$  | 4. $6 \overline{)48}$<br>$\overset{8}{0}$  | 5. $6 \overline{)30}$<br>$\overset{5}{0}$  | 6. $6 \overline{)6}$<br>$\overset{1}{0}$   |
| 7. $5 \overline{)15}$<br>$\overset{3}{0}$  | 8. $4 \overline{)8}$<br>$\overset{2}{0}$   | 9. $6 \overline{)0}$<br>$\overset{0}{0}$   | 10. $2 \overline{)18}$<br>$\overset{9}{0}$ | 11. $4 \overline{)20}$<br>$\overset{5}{0}$ | 12. $1 \overline{)6}$<br>$\overset{6}{0}$  |
| 13. $4 \overline{)16}$<br>$\overset{4}{0}$ | 14. $6 \overline{)42}$<br>$\overset{7}{0}$ | 15. $3 \overline{)21}$<br>$\overset{7}{0}$ | 16. $6 \overline{)54}$<br>$\overset{9}{0}$ | 17. $5 \overline{)35}$<br>$\overset{7}{0}$ | 18. $6 \overline{)24}$<br>$\overset{4}{0}$ |
| 19. $6 \overline{)12}$<br>$\overset{2}{0}$ | 20. $5 \overline{)30}$<br>$\overset{6}{0}$ | 21. $3 \overline{)27}$<br>$\overset{9}{0}$ | 22. $6 \overline{)36}$<br>$\overset{6}{0}$ | 23. $4 \overline{)36}$<br>$\overset{9}{0}$ | 24. $2 \overline{)12}$<br>$\overset{6}{0}$ |
| 25. $6 \div 6$<br>$\overset{1}{0}$         | 26. $20 \div 5$<br>$\overset{4}{0}$        | 27. $42 \div 6$<br>$\overset{7}{0}$        | 28. $12 \div 6$<br>$\overset{2}{0}$        | 29. $25 \div 5$<br>$\overset{5}{0}$        | 30. $30 \div 6$<br>$\overset{5}{0}$        |
| 31. $24 \div 4$<br>$\overset{6}{0}$        | 32. $0 \div 6$<br>$\overset{0}{0}$         | 33. $48 \div 6$<br>$\overset{8}{0}$        | 34. $9 \div 3$<br>$\overset{3}{0}$         | 35. $18 \div 6$<br>$\overset{3}{0}$        | 36. $54 \div 6$<br>$\overset{9}{0}$        |
| 37. $36 \div 6$<br>$\overset{6}{0}$        | 38. $6 \div 1$<br>$\overset{6}{0}$         | 39. $15 \div 3$<br>$\overset{5}{0}$        | 40. $24 \div 6$<br>$\overset{4}{0}$        | 41. $16 \div 2$<br>$\overset{8}{0}$        | 42. $21 \div 3$<br>$\overset{7}{0}$        |

Set 83 pages 224-225

- |  |  |  |  |  |  |
|--|--|--|--|--|--|
| 1. $7 \overline{)28}$<br>$\overset{4}{0}$  | 2. $7 \overline{)56}$<br>$\overset{8}{0}$  | 3. $7 \overline{)0}$<br>$\overset{0}{0}$   | 4. $7 \overline{)21}$<br>$\overset{3}{0}$  | 5. $2 \overline{)10}$<br>$\overset{5}{0}$  | 6. $7 \overline{)35}$<br>$\overset{5}{0}$  |
| 7. $7 \overline{)42}$<br>$\overset{6}{0}$  | 8. $7 \overline{)7}$<br>$\overset{1}{0}$   | 9. $2 \overline{)18}$<br>$\overset{9}{0}$  | 10. $3 \overline{)27}$<br>$\overset{9}{0}$ | 11. $7 \overline{)63}$<br>$\overset{9}{0}$ | 12. $4 \overline{)16}$<br>$\overset{4}{0}$ |
| 13. $4 \overline{)20}$<br>$\overset{5}{0}$ | 14. $5 \overline{)15}$<br>$\overset{3}{0}$ | 15. $2 \overline{)6}$<br>$\overset{3}{0}$  | 16. $7 \overline{)14}$<br>$\overset{2}{0}$ | 17. $7 \overline{)49}$<br>$\overset{7}{0}$ | 18. $6 \overline{)36}$<br>$\overset{6}{0}$ |
| 19. $3 \overline{)12}$<br>$\overset{4}{0}$ | 20. $5 \overline{)45}$<br>$\overset{9}{0}$ | 21. $3 \overline{)21}$<br>$\overset{7}{0}$ | 22. $4 \overline{)28}$<br>$\overset{7}{0}$ | 23. $4 \overline{)36}$<br>$\overset{9}{0}$ | 24. $6 \overline{)54}$<br>$\overset{9}{0}$ |
| 25. $0 \div 7$<br>$\overset{0}{0}$         | 26. $24 \div 3$<br>$\overset{8}{0}$        | 27. $42 \div 7$<br>$\overset{6}{0}$        | 28. $4 \div 1$<br>$\overset{4}{0}$         | 29. $28 \div 7$<br>$\overset{4}{0}$        | 30. $1 \div 1$<br>$\overset{1}{0}$         |
| 31. $4 \div 2$<br>$\overset{2}{0}$         | 32. $21 \div 7$<br>$\overset{3}{0}$        | 33. $45 \div 5$<br>$\overset{9}{0}$        | 34. $15 \div 3$<br>$\overset{5}{0}$        | 35. $63 \div 7$<br>$\overset{9}{0}$        | 36. $7 \div 7$<br>$\overset{1}{0}$         |
| 37. $56 \div 7$<br>$\overset{8}{0}$        | 38. $10 \div 5$<br>$\overset{2}{0}$        | 39. $49 \div 7$<br>$\overset{7}{0}$        | 40. $14 \div 7$<br>$\overset{2}{0}$        | 41. $24 \div 4$<br>$\overset{6}{0}$        | 42. $16 \div 2$<br>$\overset{8}{0}$        |
| 43. $48 \div 6$<br>$\overset{8}{0}$        | 44. $1 \div 1$<br>$\overset{1}{0}$         | 45. $32 \div 4$<br>$\overset{8}{0}$        | 46. $18 \div 6$<br>$\overset{3}{0}$        | 47. $35 \div 7$<br>$\overset{5}{0}$        | 48. $25 \div 5$<br>$\overset{5}{0}$        |



Set 85

31.  $3 \times 4 = 12$   
 $4 \times 3 = 12$   
 $12 \div 3 = 4$   
 $12 \div 4 = 3$
33.  $9 \times 9 = 81$   
 $81 \div 9 = 9$
35.  $8 \times 9 = 72$   
 $9 \times 8 = 72$   
 $72 \div 8 = 9$   
 $72 \div 9 = 8$
37.  $1 \times 6 = 6$   
 $6 \times 1 = 6$   
 $6 \div 1 = 6$   
 $6 \div 6 = 1$
39.  $3 \times 7 = 21$   
 $7 \times 3 = 21$   
 $21 \div 3 = 7$   
 $21 \div 7 = 3$
41.  $6 \times 6 = 36$   
 $36 \div 6 = 6$
32.  $5 \times 6 = 30$   
 $6 \times 5 = 30$   
 $30 \div 5 = 6$   
 $30 \div 6 = 5$
34.  $4 \times 5 = 20$   
 $5 \times 4 = 20$   
 $20 \div 4 = 5$   
 $20 \div 5 = 4$
36.  $4 \times 8 = 32$   
 $8 \times 4 = 32$   
 $32 \div 4 = 8$   
 $32 \div 8 = 4$
38.  $3 \times 5 = 15$   
 $5 \times 3 = 15$   
 $15 \div 3 = 5$   
 $15 \div 5 = 3$
40.  $2 \times 8 = 16$   
 $8 \times 2 = 16$   
 $16 \div 2 = 8$   
 $16 \div 8 = 2$
42.  $6 \times 9 = 54$   
 $9 \times 6 = 54$   
 $54 \div 6 = 9$   
 $54 \div 9 = 6$

# MORE PRACTICE

Set 84 pages 226-227

1.  $8 \overline{)8}$   
 $4 \overline{)12}$   
 $8 \overline{)40}$
2.  $8 \overline{)56}$   
 $8 \overline{)48}$   
 $7 \overline{)56}$
3.  $5 \overline{)20}$   
 $3 \overline{)21}$   
 $8 \overline{)16}$
4.  $8 \overline{)24}$   
 $6 \overline{)54}$   
 $8 \overline{)64}$
5.  $6 \overline{)42}$   
 $8 \overline{)32}$   
 $1 \overline{)4}$
6.  $8 \overline{)72}$   
 $8 \overline{)0}$   
 $8 \overline{)32}$
7.  $4 \overline{)12}$   
 $8 \overline{)40}$   
 $48 \div 8$
8.  $8 \overline{)48}$   
 $0 \div 8$   
 $0 \div 8$
9.  $3 \overline{)21}$   
 $64 \div 8$
10.  $6 \overline{)54}$   
 $3 \div 3$
11.  $8 \overline{)32}$   
 $16 \div 8$
12.  $8 \overline{)0}$   
 $56 \div 8$
13.  $8 \overline{)40}$   
 $24 \div 8$
14.  $7 \overline{)56}$   
 $24 \div 8$
15.  $8 \overline{)16}$   
 $56 \div 8$
16.  $8 \overline{)64}$   
 $24 \div 8$
17.  $1 \overline{)4}$   
 $56 \div 8$
18.  $8 \overline{)32}$   
 $56 \div 8$
19.  $48 \div 8$   
 $0 \div 8$   
 $0 \div 8$
20.  $0 \div 2$   
 $40 \div 8$
21.  $8 \div 8$   
 $64 \div 8$
22.  $36 \div 4$   
 $3 \div 3$
23.  $72 \div 8$   
 $16 \div 8$
24.  $24 \div 8$   
 $56 \div 8$
25.  $0 \div 8$   
 $40 \div 8$
26.  $40 \div 8$   
 $56 \div 8$
27.  $64 \div 8$   
 $56 \div 8$
28.  $3 \div 3$   
 $16 \div 8$
29.  $16 \div 8$   
 $56 \div 8$
30.  $56 \div 8$   
 $56 \div 8$

Set 85 pages 228-229

1.  $9 \overline{)45}$   
 $8 \overline{)56}$   
 $9 \overline{)63}$
2.  $6 \overline{)36}$   
 $9 \overline{)9}$   
 $7 \overline{)0}$
3.  $9 \overline{)72}$   
 $7 \overline{)42}$   
 $9 \overline{)81}$
4.  $9 \overline{)0}$   
 $4 \overline{)28}$   
 $9 \overline{)27}$
5.  $5 \overline{)40}$   
 $9 \overline{)18}$   
 $5 \overline{)35}$
6.  $9 \overline{)54}$   
 $5 \overline{)5}$   
 $9 \overline{)36}$
7.  $8 \overline{)56}$   
 $9 \overline{)9}$   
 $9 \overline{)63}$
8.  $9 \overline{)9}$   
 $0 \div 9$   
 $27 \div 9$
9.  $7 \overline{)42}$   
 $54 \div 9$   
 $54 \div 9$
10.  $4 \overline{)28}$   
 $0 \div 9$   
 $27 \div 9$
11.  $9 \overline{)18}$   
 $27 \div 3$
12.  $5 \overline{)5}$   
 $45 \div 9$
13.  $9 \overline{)63}$   
 $18 \div 9$   
 $81 \div 9$
14.  $7 \overline{)0}$   
 $54 \div 6$   
 $27 \div 9$
15.  $9 \overline{)81}$   
 $72 \div 9$   
 $54 \div 9$
16.  $9 \overline{)27}$   
 $36 \div 9$   
 $0 \div 9$
17.  $5 \overline{)35}$   
 $9 \div 9$   
 $27 \div 3$
18.  $9 \overline{)36}$   
 $63 \div 9$   
 $45 \div 9$
19.  $18 \div 9$   
 $54 \div 6$   
 $27 \div 9$
20.  $54 \div 6$   
 $72 \div 9$   
 $54 \div 9$
21.  $72 \div 9$   
 $36 \div 9$   
 $0 \div 9$
22.  $36 \div 9$   
 $9 \div 9$   
 $27 \div 3$
23.  $9 \div 9$   
 $63 \div 9$   
 $45 \div 9$
24.  $63 \div 9$   
 $45 \div 9$
25.  $81 \div 9$   
 $27 \div 9$   
 $54 \div 9$
26.  $27 \div 9$   
 $54 \div 9$   
 $54 \div 9$
27.  $54 \div 9$   
 $36 \div 9$   
 $0 \div 9$
28.  $0 \div 9$   
 $9 \div 9$   
 $27 \div 3$
29.  $27 \div 3$   
 $63 \div 9$   
 $45 \div 9$
30.  $45 \div 9$   
 $45 \div 9$

Write a family of facts using the given numbers. See margin.

31. 3, 4, 12  
 32. 6, 30, 5  
 33. 9, 81  
 34. 4, 5, 20  
 35. 72, 8, 9  
 36. 8, 4, 32  
 37. 6, 1  
 38. 3, 5, 15  
 39. 21, 3, 7  
 40. 16, 8, 2  
 41. 6, 36  
 42. 6, 9, 54

Set 86 pages 230-231 Solve each problem.

1. Jan had 30 papers to deliver. She delivered 12 papers on Elm Street and 9 papers on Oak Avenue. How many papers did she have left to deliver on Forest Road?  
**9 papers**
2. Chuck had 4 bags of groceries with 5 items in each bag. He wanted to put all of his groceries in 2 bags. If he put the same number of items in each of the 2 bags, how many items would he have in each bag?  
**10 items**
3. Eric picked 16 tomatoes and Anne picked 11 tomatoes. They separated the tomatoes into groups of 3. How many tomatoes were in each group?  
**9 tomatoes**
4. There were 17 girls and 12 boys at the park. 4 more boys came to the park to play tennis. How many more girls than boys were at the park?  
**1 more girl**
5. In art class, there were 16 children painting pictures and 3 groups of 4 children each putting models together. How many children were in art class?  
**28 children**
6. Theresa has 11 cousins. Haruo has 3 fewer cousins than Theresa. Susan has 4 fewer cousins than Haruo. How many cousins does Susan have?  
**4 cousins**



**Set 87** pages 234–235

- |                                |                                |                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. $3 \overline{)14}$<br>4 R2  | 2. $4 \overline{)26}$<br>6 R2  | 3. $6 \overline{)16}$<br>2 R4  | 4. $8 \overline{)58}$<br>7 R2  | 5. $2 \overline{)15}$<br>7 R1  | 6. $7 \overline{)16}$<br>2 R2  |
| 7. $4 \overline{)35}$<br>8 R3  | 8. $9 \overline{)16}$<br>1 R7  | 9. $3 \overline{)19}$<br>6 R1  | 10. $8 \overline{)19}$<br>2 R3 | 11. $9 \overline{)38}$<br>4 R2 | 12. $5 \overline{)12}$<br>2 R2 |
| 13. $7 \overline{)62}$<br>8 R6 | 14. $2 \overline{)13}$<br>6 R1 | 15. $6 \overline{)34}$<br>5 R4 | 16. $4 \overline{)22}$<br>5 R2 | 17. $3 \overline{)23}$<br>7 R2 | 18. $6 \overline{)42}$<br>7    |
| 19. $7 \overline{)48}$<br>6 R6 | 20. $8 \overline{)42}$<br>5 R2 | 21. $5 \overline{)40}$<br>8    | 22. $7 \overline{)24}$<br>3 R3 | 23. $8 \overline{)23}$<br>2 R7 | 24. $2 \overline{)10}$<br>5    |
| 25. $5 \overline{)11}$<br>2 R1 | 26. $3 \overline{)21}$<br>7    | 27. $9 \overline{)44}$<br>4 R8 | 28. $6 \overline{)52}$<br>8 R4 | 29. $5 \overline{)36}$<br>7 R1 | 30. $7 \overline{)33}$<br>4 R5 |
| 31. $17 \div 2$<br>8 R1        | 32. $31 \div 4$<br>7 R3        | 33. $43 \div 5$<br>8 R3        | 34. $25 \div 7$<br>3 R4        | 35. $62 \div 9$<br>6 R8        | 36. $21 \div 6$<br>3 R3        |
| 37. $15 \div 4$<br>3 R3        | 38. $52 \div 7$<br>7 R3        | 39. $75 \div 8$<br>9 R3        | 40. $58 \div 6$<br>9 R4        | 41. $17 \div 3$<br>5 R2        | 42. $27 \div 5$<br>5 R2        |
| 43. $27 \div 7$<br>3 R6        | 44. $10 \div 3$<br>3 R1        | 45. $11 \div 2$<br>5 R1        | 46. $12 \div 8$<br>1 R4        | 47. $24 \div 4$<br>6           | 48. $16 \div 3$<br>5 R1        |
| 49. $36 \div 8$<br>4 R4        | 50. $28 \div 6$<br>4 R4        | 51. $57 \div 9$<br>6 R3        | 52. $28 \div 5$<br>5 R3        | 53. $19 \div 2$<br>9 R1        | 54. $64 \div 8$<br>8           |
| 55. $72 \div 9$<br>8           | 56. $19 \div 5$<br>3 R4        | 57. $56 \div 7$<br>8           | 58. $37 \div 4$<br>9 R1        | 59. $29 \div 9$<br>3 R2        | 60. $43 \div 6$<br>7 R1        |

**Set 88** pages 236–237 Tell whether you *add*, *subtract*, *multiply*, or *divide*. Then find the answer.

- There are 18 boats in the harbor with yellow sails and 33 boats in the harbor with white sails. How many more boats have white sails than yellow sails?  
**Subtract. 15 more boats**
- Dan ran 30 laps on the running track. How many miles did Dan run if 5 laps equal one mile?  
**Divide. 6 miles**
- Mrs. Chong spent \$43.10 at the butcher, \$26.37 at the grocery store, and \$11.54 at the fruit and vegetable stand. What was the total cost of her purchases?  
**Add. \$81.01**
- Kelly has 23 children in her classroom. Sally has 5 more children in her classroom than Kelly. How many children are in Sally's classroom?  
**Add. 28 children**
- At the local radio station there are 5 minutes of news, 2 minutes of sports, and 14 minutes for commercials each hour. How many minutes of each hour are used for these items?  
**Add. 21 minutes**
- During a one-hour period, 9 airplanes took off from Parker Field. If the same number of planes took off each hour, how many planes took off in 8 hours?  
**Multiply. 72 planes**
- At the school fair, 7 students sold 8 balloons each. How many balloons did they sell in all?  
**Multiply. 56 balloons**
- Laura put 26 pictures in her album with 4 pictures on each page. How many pages did she fill? How many pictures were left over?  
**Divide. 6 pages, 2 pictures left over**
- Donato has saved \$6.45. The game he wants to buy costs \$9.99. How much more money does he need to save before he can buy the game?  
**Subtract. \$3.54 more**
- Katie put 34 candles on her mother's birthday cake in rows with 8 candles in each row. How many rows were filled? How many candles were left over?  
**Divide. 4 rows, 2 candles left over**



# MORE PRACTICE

Set 89 pages 242-243 Check each division. If the answer is wrong, give the correct answer.

- |  |   |  |   |  |  |   |
|--|---|--|---|--|--|---|
| 1. $\overset{11}{7}\overline{)79}$ R2<br>Correct | 2. $\overset{13}{5}\overline{)65}$<br>Correct | 3. $\overset{15}{6}\overline{)92}$ R1<br>15 R2 | 4. $\overset{25}{3}\overline{)74}$<br>24 R2 | 5. $\overset{11}{4}\overline{)46}$ R2<br>Correct | 6. $\overset{17}{3}\overline{)56}$ R5<br>18 R2 | 7. $\overset{18}{2}\overline{)36}$<br>Correct |
|--|---|--|---|--|--|---|
- Divide.
- |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
| 8. $\overset{13}{2}\overline{)26}$     | 9. $\overset{11}{4}\overline{)47}$ R3  | 10. $\overset{11}{7}\overline{)83}$ R6 | 11. $\overset{18}{3}\overline{)56}$ R2 | 12. $\overset{12}{4}\overline{)51}$ R3 | 13. $\overset{15}{5}\overline{)75}$    | 14. $\overset{11}{8}\overline{)89}$ R1 | 15. $\overset{12}{5}\overline{)62}$ R2 |
| 16. $\overset{11}{7}\overline{)81}$ R4 | 17. $\overset{46}{2}\overline{)93}$ R1 | 18. $\overset{14}{5}\overline{)71}$ R1 | 19. $\overset{12}{8}\overline{)96}$    | 20. $\overset{12}{6}\overline{)74}$ R2 | 21. $\overset{18}{2}\overline{)37}$ R1 | 22. $\overset{11}{7}\overline{)82}$ R5 | 23. $\overset{14}{4}\overline{)58}$ R2 |
| 24. $\overset{21}{4}\overline{)86}$ R2 | 25. $\overset{14}{2}\overline{)29}$ R1 | 26. $\overset{14}{3}\overline{)43}$ R1 | 27. $\overset{12}{5}\overline{)64}$ R4 | 28. $\overset{11}{6}\overline{)71}$ R5 | 29. $\overset{14}{7}\overline{)99}$ R1 | 30. $\overset{16}{2}\overline{)32}$    | 31. $\overset{11}{6}\overline{)68}$ R2 |
| 32. $\overset{13}{3}\overline{)39}$    | 33. $\overset{31}{3}\overline{)94}$ R1 | 34. $\overset{12}{6}\overline{)76}$ R4 | 35. $\overset{43}{2}\overline{)87}$ R1 | 36. $\overset{21}{3}\overline{)65}$ R2 | 37. $\overset{12}{5}\overline{)63}$ R3 | 38. $\overset{28}{2}\overline{)57}$ R1 | 39. $\overset{18}{5}\overline{)94}$ R4 |
| 40. $\overset{11}{8}\overline{)91}$ R3 | 41. $\overset{16}{5}\overline{)83}$ R3 | 42. $\overset{14}{7}\overline{)98}$    | 43. $\overset{23}{4}\overline{)92}$    | 44. $\overset{13}{6}\overline{)79}$ R1 | 45. $\overset{12}{4}\overline{)51}$ R3 | 46. $\overset{27}{3}\overline{)82}$ R1 | 47. $\overset{12}{8}\overline{)98}$ R2 |
| 48. $\overset{24}{3}\overline{)74}$ R2 | 49. $\overset{14}{4}\overline{)59}$ R3 | 50. $\overset{12}{6}\overline{)73}$ R1 | 51. $\overset{21}{3}\overline{)65}$ R2 | 52. $\overset{12}{7}\overline{)87}$ R3 | 53. $\overset{11}{8}\overline{)93}$ R5 | 54. $\overset{32}{3}\overline{)97}$ R1 | 55. $\overset{17}{5}\overline{)86}$ R2 |

Set 90 pages 244-245

- |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
| 1. $\overset{20}{3}\overline{)60}$     | 2. $\overset{20}{4}\overline{)80}$     | 3. $\overset{10}{6}\overline{)60}$     | 4. $\overset{30}{2}\overline{)60}$     | 5. $\overset{10}{9}\overline{)90}$     | 6. $\overset{40}{2}\overline{)80}$     | 7. $\overset{10}{4}\overline{)40}$     | 8. $\overset{10}{5}\overline{)50}$     |
| 9. $\overset{10}{8}\overline{)82}$ R2  | 10. $\overset{10}{3}\overline{)31}$ R1 | 11. $\overset{10}{4}\overline{)43}$ R3 | 12. $\overset{10}{3}\overline{)32}$ R2 | 13. $\overset{10}{6}\overline{)65}$ R5 | 14. $\overset{10}{4}\overline{)41}$ R1 | 15. $\overset{20}{2}\overline{)41}$ R1 | 16. $\overset{10}{3}\overline{)30}$    |
| 17. $\overset{30}{3}\overline{)92}$ R2 | 18. $\overset{10}{6}\overline{)64}$ R4 | 19. $\overset{20}{4}\overline{)81}$ R1 | 20. $\overset{10}{5}\overline{)54}$    | 21. $\overset{10}{8}\overline{)86}$ R6 | 22. $\overset{10}{9}\overline{)96}$ R6 | 23. $\overset{10}{7}\overline{)76}$ R6 | 24. $\overset{20}{4}\overline{)83}$ R3 |
| 25. $\overset{20}{3}\overline{)61}$ R1 | 26. $\overset{10}{2}\overline{)21}$ R1 | 27. $\overset{10}{6}\overline{)61}$ R1 | 28. $\overset{10}{5}\overline{)51}$ R1 | 29. $\overset{30}{3}\overline{)91}$ R1 | 30. $\overset{20}{4}\overline{)82}$ R2 | 31. $\overset{10}{9}\overline{)97}$ R7 | 32. $\overset{10}{8}\overline{)82}$ R2 |
| 33. $\overset{10}{8}\overline{)85}$ R5 | 34. $\overset{10}{7}\overline{)72}$ R2 | 35. $\overset{10}{4}\overline{)42}$ R2 | 36. $\overset{30}{2}\overline{)61}$ R1 | 37. $\overset{40}{2}\overline{)81}$ R1 | 38. $\overset{10}{5}\overline{)52}$ R2 | 39. $\overset{10}{6}\overline{)65}$ R5 | 40. $\overset{10}{7}\overline{)74}$ R4 |
| 41. $\overset{10}{6}\overline{)63}$ R3 | 42. $\overset{10}{9}\overline{)92}$ R2 | 43. $\overset{10}{7}\overline{)73}$ R3 | 44. $\overset{10}{6}\overline{)62}$ R2 | 45. $\overset{20}{3}\overline{)62}$ R2 | 46. $\overset{10}{5}\overline{)53}$ R3 | 47. $\overset{10}{8}\overline{)83}$ R3 | 48. $\overset{10}{9}\overline{)98}$ R8 |

Set 91 pages 246-247

- |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| 1. $\overset{142}{2}\overline{)284}$     | 2. $\overset{113}{7}\overline{)791}$     | 3. $\overset{113}{5}\overline{)565}$     | 4. $\overset{214}{3}\overline{)642}$     | 5. $\overset{418}{2}\overline{)836}$     | 6. $\overset{212}{4}\overline{)848}$     | 7. $\overset{119}{5}\overline{)595}$     |
| 8. $\overset{313}{2}\overline{)626}$     | 9. $\overset{119}{4}\overline{)476}$     | 10. $\overset{114}{6}\overline{)684}$    | 11. $\overset{246}{2}\overline{)492}$    | 12. $\overset{114}{5}\overline{)570}$    | 13. $\overset{112}{7}\overline{)784}$    | 14. $\overset{112}{8}\overline{)896}$    |
| 15. $\overset{112}{6}\overline{)672}$    | 16. $\overset{118}{5}\overline{)593}$ R3 | 17. $\overset{111}{8}\overline{)892}$ R4 | 18. $\overset{116}{4}\overline{)465}$ R1 | 19. $\overset{173}{2}\overline{)346}$    | 20. $\overset{189}{3}\overline{)567}$    | 21. $\overset{112}{6}\overline{)673}$ R1 |
| 22. $\overset{133}{4}\overline{)532}$    | 23. $\overset{241}{3}\overline{)725}$ R2 | 24. $\overset{162}{3}\overline{)486}$    | 25. $\overset{124}{8}\overline{)992}$    | 26. $\overset{235}{2}\overline{)471}$ R1 | 27. $\overset{132}{3}\overline{)397}$ R1 | 28. $\overset{132}{5}\overline{)662}$ R2 |
| 29. $\overset{284}{3}\overline{)852}$    | 30. $\overset{119}{6}\overline{)715}$ R1 | 31. $\overset{164}{5}\overline{)823}$ R3 | 32. $\overset{127}{3}\overline{)381}$    | 33. $\overset{117}{7}\overline{)824}$ R5 | 34. $\overset{114}{8}\overline{)915}$ R3 | 35. $\overset{157}{4}\overline{)628}$    |
| 36. $\overset{133}{7}\overline{)937}$ R6 | 37. $\overset{228}{4}\overline{)913}$ R1 | 38. $\overset{274}{3}\overline{)823}$ R1 | 39. $\overset{131}{2}\overline{)263}$ R1 | 40. $\overset{111}{8}\overline{)888}$    | 41. $\overset{115}{4}\overline{)460}$    | 42. $\overset{115}{8}\overline{)924}$ R4 |
| 43. $\overset{149}{5}\overline{)745}$    | 44. $\overset{164}{3}\overline{)492}$    | 45. $\overset{134}{7}\overline{)938}$    | 46. $\overset{165}{6}\overline{)995}$ R5 | 47. $\overset{123}{7}\overline{)867}$ R6 | 48. $\overset{186}{4}\overline{)746}$ R2 | 49. $\overset{192}{5}\overline{)962}$ R2 |



Set 92 pages 248-249

- |                                  |                                  |                                   |                                |                                   |                                |
|----------------------------------|----------------------------------|-----------------------------------|--------------------------------|-----------------------------------|--------------------------------|
| 1. $2 \overline{)460}$<br>120 R3 | 2. $6 \overline{)600}$<br>100    | 3. $3 \overline{)930}$<br>310     | 4. $4 \overline{)804}$<br>201  | 5. $8 \overline{)824}$<br>103     | 6. $4 \overline{)420}$<br>105  |
| 7. $5 \overline{)603}$<br>170 R1 | 8. $3 \overline{)902}$<br>300 R2 | 9. $2 \overline{)611}$<br>305 R1  | 10. $5 \overline{)545}$<br>109 | 11. $9 \overline{)928}$<br>103 R1 | 12. $7 \overline{)735}$<br>105 |
| 13. $3 \overline{)511}$          | 14. $2 \overline{)208}$<br>104   | 15. $7 \overline{)986}$<br>140 R6 | 16. $6 \overline{)642}$<br>107 | 17. $8 \overline{)840}$<br>105    | 18. $5 \overline{)850}$<br>170 |
| 19. $728 \div 7$<br>104          | 20. $408 \div 4$<br>102          | 21. $631 \div 3$<br>210 R1        | 22. $864 \div 8$<br>108        | 23. $515 \div 5$<br>103           | 24. $806 \div 2$<br>403        |
| 25. $900 \div 3$<br>300          | 26. $705 \div 7$<br>100 R5       | 27. $807 \div 2$<br>403 R1        | 28. $775 \div 7$<br>110 R5     | 29. $636 \div 6$<br>106           | 30. $860 \div 8$<br>107 R4     |
| 31. $714 \div 7$<br>102          | 32. $481 \div 4$<br>120 R1       | 33. $750 \div 5$<br>150           | 34. $413 \div 2$<br>206 R1     | 35. $921 \div 3$<br>307           | 36. $612 \div 6$<br>102        |

Set 93 pages 250-251 Tell how many digits will be in each quotient.

- |                             |                             |                              |                              |                              |                              |                              |
|-----------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| 1. $4 \overline{)35}$<br>1  | 2. $7 \overline{)58}$<br>1  | 3. $3 \overline{)21}$<br>1   | 4. $4 \overline{)93}$<br>2   | 5. $6 \overline{)72}$<br>2   | 6. $5 \overline{)638}$<br>3  | 7. $7 \overline{)227}$<br>2  |
| 8. $8 \overline{)910}$<br>3 | 9. $5 \overline{)696}$<br>3 | 10. $4 \overline{)537}$<br>3 | 11. $5 \overline{)322}$<br>2 | 12. $4 \overline{)916}$<br>3 | 13. $3 \overline{)416}$<br>3 | 14. $2 \overline{)163}$<br>2 |

Divide.

- |                                   |                                  |                                |                                 |                                   |                                  |
|-----------------------------------|----------------------------------|--------------------------------|---------------------------------|-----------------------------------|----------------------------------|
| 15. $2 \overline{)64}$<br>32      | 16. $5 \overline{)48}$<br>9 R3   | 17. $3 \overline{)23}$<br>7 R2 | 18. $7 \overline{)86}$<br>12 R2 | 19. $9 \overline{)73}$<br>8 R1    | 20. $4 \overline{)57}$<br>14 R1  |
| 21. $7 \overline{)764}$<br>109 R1 | 22. $6 \overline{)596}$<br>99 R2 | 23. $4 \overline{)216}$<br>54  | 24. $5 \overline{)735}$<br>147  | 25. $3 \overline{)619}$<br>206 R1 | 26. $9 \overline{)823}$<br>91 R4 |
| 27. $6 \overline{)719}$<br>119 R5 | 28. $8 \overline{)283}$<br>35 R3 | 29. $9 \overline{)819}$<br>91  | 30. $4 \overline{)352}$<br>88   | 31. $7 \overline{)637}$<br>91     | 32. $2 \overline{)156}$<br>78    |
| 33. $837 \div 9$<br>93            | 34. $694 \div 2$<br>347          | 35. $255 \div 3$<br>85         | 36. $288 \div 9$<br>32          | 37. $373 \div 4$<br>93 R1         | 38. $623 \div 7$<br>89           |
| 39. $245 \div 5$<br>49            | 40. $742 \div 7$<br>106          | 41. $320 \div 4$<br>80         | 42. $432 \div 6$<br>72          | 43. $119 \div 2$<br>59 R1         | 44. $291 \div 3$<br>97           |
| 45. $512 \div 8$<br>64            | 46. $156 \div 6$<br>26           | 47. $324 \div 5$<br>64 R4      | 48. $387 \div 4$<br>96 R3       | 49. $613 \div 8$<br>76 R5         | 50. $607 \div 5$<br>121 R2       |

Set 94 pages 252-253 Divide. Write each answer as dollars and cents.

- |                               |                               |                               |                               |                               |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1. $\$3.20 \div 2$<br>\$1.60  | 2. $\$0.96 \div 4$<br>\$0.24  | 3. $\$6.36 \div 6$<br>\$1.06  | 4. $\$9.68 \div 8$<br>\$1.21  | 5. $\$3.42 \div 6$<br>\$0.57  |
| 6. $\$4.86 \div 3$<br>\$1.62  | 7. $\$8.82 \div 7$<br>\$1.26  | 8. $\$9.92 \div 8$<br>\$1.24  | 9. $\$9.87 \div 3$<br>\$3.29  | 10. $\$7.92 \div 6$<br>\$1.32 |
| 11. $\$8.96 \div 2$<br>\$4.48 | 12. $\$7.53 \div 3$<br>\$2.51 | 13. $\$9.87 \div 7$<br>\$1.41 | 14. $\$6.05 \div 5$<br>\$1.21 | 15. $\$7.48 \div 4$<br>\$1.87 |
| 16. $\$2.96 \div 8$<br>\$0.37 | 17. $\$9.42 \div 3$<br>\$3.14 | 18. $\$7.74 \div 6$<br>\$1.29 | 19. $\$8.94 \div 3$<br>\$2.98 | 20. $\$6.15 \div 5$<br>\$1.23 |
| 21. $\$8.13 \div 3$<br>\$2.71 | 22. $\$8.12 \div 7$<br>\$1.16 | 23. $\$8.48 \div 8$<br>\$1.06 | 24. $\$7.62 \div 6$<br>\$1.27 | 25. $\$8.68 \div 4$<br>\$2.17 |
| 26. $\$1.80 \div 5$<br>\$0.36 | 27. $\$8.72 \div 4$<br>\$2.18 | 28. $\$9.24 \div 7$<br>\$1.32 | 29. $\$9.00 \div 9$<br>\$1.00 | 30. $\$7.38 \div 2$<br>\$3.69 |
| 31. $\$7.50 \div 5$<br>\$1.50 | 32. $\$9.54 \div 9$<br>\$1.06 | 33. $\$8.70 \div 5$<br>\$1.74 | 34. $\$9.24 \div 6$<br>\$1.54 | 35. $\$8.76 \div 6$<br>\$1.46 |



# MORE PRACTICE

**Set 95** pages 256–257 Solve each problem.

- Mr. Pucci is planting flowers in his garden. He has 48 plants to put in rows of 5 each. How many plants will he have left over?  
**3 plants left over**
- Jerry needs to buy 74 stamps. The stamps are sold in packets of 8 each. How many packets does he need to buy?  
**10 packets**
- If 3 party favors are put in each child's party bag, how many party bags can be made with 37 favors? How many party favors will be left over?  
**12 bags, 1 favor left over**
- Ramona has 35 pictures to put in her photo album. If she puts 4 pictures on each page, how many pictures will be left over?  
**3 pictures left over**
- Heidi must sell \$25 worth of cards to go on her band trip. How many boxes of cards must she sell if each box costs \$2?  
**13 boxes**
- Vicente has 113 inches of string. How many 9-inch pieces of string can he make if he uses the entire string?  
**12 pieces**

**Set 96** pages 258–259 Find the average of each group of numbers.

- 3, 8, 4  
**5**
- 2, 6, 8, 8  
**6**
- 6, 5, 18, 11  
**10**
- 216, 104, 97  
**139**
- 112, 116, 111  
**113**
- 2, 4, 6, 8, 10  
**6**
- 112, 134, 126, 103, 115  
**118**
- 7, 6, 8  
**7**
- 4, 3, 1, 4  
**3**
- 8, 14, 19, 11  
**13**
- 92, 34, 16, 56, 87  
**57**
- 84, 26, 37  
**49**
- 3, 9, 17, 14, 2  
**9**
- 184, 153, 124, 201, 213  
**175**
- 5, 6, 16  
**9**
- 2, 9, 9, 8  
**7**
- 36, 22, 17, 25  
**25**
- 177, 224, 196, 203  
**200**
- 31, 92, 75  
**66**
- 100, 200, 100, 200  
**150**
- 206, 196, 172, 235, 101  
**182**

**Set 97** pages 260–261

- $20 \overline{)80}$   
**4**
- $30 \overline{)60}$   
**2**
- $40 \overline{)80}$   
**2**
- $30 \overline{)120}$   
**4**
- $20 \overline{)160}$   
**8**
- $50 \overline{)150}$   
**3**
- $90 \overline{)450}$   
**5**
- $20 \overline{)180}$   
**9**
- $60 \overline{)360}$   
**6**
- $70 \overline{)210}$   
**3**
- $80 \overline{)640}$   
**8**
- $40 \overline{)320}$   
**8**
- $60 \overline{)486}$   
**8 R6**
- $70 \overline{)563}$   
**8 R3**
- $50 \overline{)359}$   
**7 R9**
- $80 \overline{)325}$   
**4 R5**
- $70 \overline{)289}$   
**4 R9**
- $50 \overline{)206}$   
**4 R6**
- $30 \overline{)276}$   
**9 R6**
- $40 \overline{)362}$   
**9 R2**
- $90 \overline{)723}$   
**8 R3**
- $20 \overline{)184}$   
**9 R4**
- $80 \overline{)403}$   
**5 R3**
- $60 \overline{)546}$   
**9 R6**
- $80 \overline{)486}$   
**6 R6**
- $40 \overline{)261}$   
**6 R21**
- $70 \overline{)583}$   
**8 R23**
- $90 \overline{)642}$   
**7 R12**
- $30 \overline{)236}$   
**7 R26**
- $60 \overline{)557}$   
**9 R17**
- $90 \overline{)834}$   
**9 R24**
- $20 \overline{)116}$   
**5 R16**
- $40 \overline{)248}$   
**6 R8**
- $60 \overline{)372}$   
**6 R12**
- $50 \overline{)417}$   
**8 R17**
- $80 \overline{)552}$   
**6 R72**
- $30 \overline{)247}$   
**8 R7**
- $30 \overline{)112}$   
**3 R22**
- $20 \overline{)145}$   
**7 R5**
- $70 \overline{)363}$   
**5 R13**
- $40 \overline{)294}$   
**7 R14**
- $50 \overline{)467}$   
**9 R17**



Set 98 pages 262-263

- |                                   |                                  |                                   |                                  |                                  |                                   |
|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| 1. $43 \overline{)86}$<br>2 R10   | 2. $21 \overline{)147}$<br>2 R7  | 3. $23 \overline{)138}$<br>1 R6   | 4. $34 \overline{)102}$<br>1 R8  | 5. $52 \overline{)107}$<br>2 R3  | 6. $25 \overline{)77}$<br>1 R24   |
| 7. $34 \overline{)78}$<br>8 R3    | 8. $45 \overline{)97}$<br>4 R59  | 9. $57 \overline{)63}$<br>4 R8    | 10. $76 \overline{)84}$<br>5 R11 | 11. $48 \overline{)99}$<br>5 R3  | 12. $62 \overline{)86}$<br>4 R1   |
| 13. $22 \overline{)179}$<br>6 R10 | 14. $72 \overline{)347}$<br>3 R3 | 15. $32 \overline{)136}$<br>6 R31 | 16. $84 \overline{)431}$<br>5 R2 | 17. $45 \overline{)228}$<br>9 R9 | 18. $37 \overline{)149}$<br>8 R12 |
| 19. $68 \overline{)418}$          | 20. $42 \overline{)129}$         | 21. $97 \overline{)613}$          | 22. $59 \overline{)297}$         | 23. $93 \overline{)846}$         | 24. $63 \overline{)516}$          |
| 25. $56 \div 28$<br>2             | 26. $490 \div 70$<br>7           | 27. $528 \div 66$<br>8            | 28. $111 \div 37$<br>3           | 29. $308 \div 44$<br>7           | 30. $265 \div 53$<br>5            |
| 31. $84 \div 41$<br>2 R2          | 32. $268 \div 32$<br>8 R12       | 33. $197 \div 47$<br>4 R9         | 34. $487 \div 51$<br>9 R28       | 35. $689 \div 75$<br>9 R14       | 36. $229 \div 54$<br>4 R13        |
| 37. $99 \div 31$<br>3 R6          | 38. $419 \div 62$<br>6 R47       | 39. $256 \div 83$<br>3 R7         | 40. $895 \div 98$<br>9 R13       | 41. $846 \div 92$<br>9 R18       | 42. $374 \div 49$<br>7 R31        |

Set 99 pages 264-265

- |                                  |                                   |                                   |                                   |                                   |                                   |
|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. $21 \overline{)40}$<br>5 R46  | 2. $12 \overline{)46}$<br>4 R14   | 3. $67 \overline{)253}$<br>3 R49  | 4. $24 \overline{)178}$<br>6 R23  | 5. $72 \overline{)286}$<br>2 R30  | 6. $87 \overline{)681}$<br>5 R69  |
| 7. $56 \overline{)326}$<br>3 R14 | 8. $24 \overline{)110}$<br>5 R47  | 9. $51 \overline{)202}$<br>6 R70  | 10. $45 \overline{)293}$<br>5 R14 | 11. $36 \overline{)102}$<br>5 R44 | 12. $96 \overline{)549}$<br>2 R47 |
| 13. $24 \overline{)86}$<br>5 R28 | 14. $63 \overline{)362}$<br>3 R88 | 15. $72 \overline{)502}$<br>7 R61 | 16. $48 \overline{)254}$<br>8 R10 | 17. $59 \overline{)339}$<br>4 R61 | 18. $56 \overline{)159}$<br>9     |
| 19. $34 \overline{)198}$         | 20. $92 \overline{)364}$          | 21. $73 \overline{)572}$          | 22. $23 \overline{)194}$          | 23. $75 \overline{)361}$          | 24. $24 \overline{)216}$          |
| 25. $146 \div 37$<br>3 R35       | 26. $182 \div 48$<br>3 R38        | 27. $368 \div 42$<br>8 R32        | 28. $183 \div 31$<br>5 R28        | 29. $296 \div 43$<br>6 R38        | 30. $572 \div 83$<br>6 R74        |
| 31. $452 \div 51$<br>8 R44       | 32. $284 \div 29$<br>9 R23        | 33. $309 \div 63$<br>4 R57        | 34. $254 \div 86$<br>2 R82        | 35. $211 \div 71$<br>2 R69        | 36. $162 \div 59$<br>2 R44        |
| 37. $173 \div 44$<br>3 R41       | 38. $359 \div 52$<br>6 R47        | 39. $284 \div 33$<br>8 R20        | 40. $487 \div 62$<br>7 R53        | 41. $404 \div 84$<br>4 R68        | 42. $236 \div 37$<br>6 R14        |

Set 100 pages 266-267

- |                                    |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $24 \overline{)286}$<br>11 R8   | 2. $36 \overline{)772}$<br>11 R74  | 3. $66 \overline{)793}$<br>11 R5   | 4. $73 \overline{)861}$<br>32 R1   | 5. $41 \overline{)565}$<br>12 R19  | 6. $23 \overline{)487}$<br>21 R21  |
| 7. $65 \overline{)723}$<br>23 R3   | 8. $82 \overline{)976}$<br>22      | 9. $74 \overline{)819}$<br>12 R7   | 10. $31 \overline{)993}$<br>18 R3  | 11. $59 \overline{)727}$<br>11 R46 | 12. $45 \overline{)966}$<br>21 R15 |
| 13. $43 \overline{)992}$<br>23 R3  | 14. $22 \overline{)484}$<br>21 R2  | 15. $21 \overline{)259}$<br>13 R6  | 16. $42 \overline{)759}$<br>16     | 17. $77 \overline{)893}$<br>31 R11 | 18. $32 \overline{)687}$<br>11 R7  |
| 19. $31 \overline{)716}$<br>11 R11 | 20. $47 \overline{)989}$<br>12 R23 | 21. $56 \overline{)734}$<br>21 R5  | 22. $33 \overline{)528}$<br>13 R18 | 23. $22 \overline{)693}$<br>12 R12 | 24. $90 \overline{)997}$<br>21 R10 |
| 25. $58 \overline{)649}$<br>13 R44 | 26. $75 \overline{)923}$<br>22 R1  | 27. $37 \overline{)782}$<br>12     | 28. $75 \overline{)993}$<br>31 R10 | 29. $67 \overline{)816}$<br>11 R26 | 30. $28 \overline{)598}$<br>21 R4  |
| 31. $64 \overline{)876}$<br>21 R8  | 32. $36 \overline{)793}$<br>12 R28 | 33. $72 \overline{)864}$<br>11 R26 | 34. $25 \overline{)785}$<br>23     | 35. $76 \overline{)862}$<br>12 R8  | 36. $39 \overline{)823}$<br>12 R9  |
| 37. $28 \overline{)596}$           | 38. $57 \overline{)712}$           | 39. $87 \overline{)983}$           | 40. $38 \overline{)874}$           | 41. $79 \overline{)956}$           | 42. $68 \overline{)825}$           |



# MORE PRACTICE

Answers, page 388

Set 102

13. Six and seven tenths
14. Eight and two tenths
15. Three tenths
16. One and four tenths
17. Nine and eight tenths
18. Six tenths
19. Two and five tenths
20. One and nine tenths
21. Five and three tenths
22. Nine and one tenth
23. Three and six tenths
24. One tenth
25. Seven and two tenths
26. Two and eight tenths
27. Three and seven tenths
28. Eight and six tenths

Set 103

10. Forty-six hundredths
11. Seven hundredths
12. Five and three hundredths
13. Eight and thirty-six hundredths
14. Eighty-one hundredths
15. One and twenty hundredths
16. Three and sixteen hundredths
17. Two and fifty-four hundredths
18. Thirty-six hundredths
19. One and eight hundredths
20. Three and thirty-three hundredths
21. Seven and forty hundredths
22. Two and eighty-five hundredths
23. Four and six hundredths

Set 101 pages 270-271 Write an equation. Then find the answer.

1. Mr. Hale drove his car 212 miles in 4 hours. What was his average speed in miles per hour?  
 $212 \div 4 = n$  53 miles per hour
2. Michele played tennis for 137 minutes. How many hours and minutes is this? (60 minutes = 1 hour)  
 $137 \div 60 = n$  2 hours 17 minutes
3. 34 buses left the bus terminal each hour. How many buses left the bus terminal in 5 hours?  
 $34 \times 5 = n$  170 buses
4. The movie showing at the Sunshine Theater ran for 202 minutes. How many hours and minutes is this?  
 $202 \div 60 = n$  3 hours 22 minutes

Set 102 pages 278-279 Write each decimal.



0.3

4. three tenths

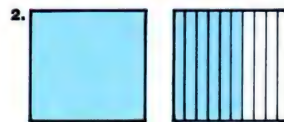
0.3

7. six tenths

0.6

10. seven tenths

0.7



1.6

5. one and two tenths

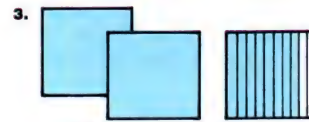
1.2

8. four and one tenth

4.1

11. eight and four tenths

8.4



2.8

6. two and nine tenths

2.9

9. three and eight tenths

3.8

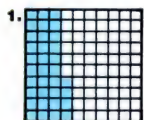
12. five and seven tenths

5.7

Write each decimal in words. See margin.

- |         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 13. 6.7 | 14. 8.2 | 15. 0.3 | 16. 1.4 | 17. 9.8 | 18. 0.6 | 19. 2.5 | 20. 1.9 |
| 21. 5.3 | 22. 9.1 | 23. 3.6 | 24. 0.1 | 25. 7.2 | 26. 2.8 | 27. 3.7 | 28. 8.6 |

Set 103 pages 280-281 Write each decimal.



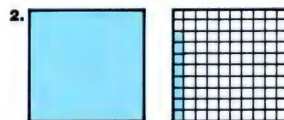
0.34

4. thirty-nine hundredths

0.39

7. three hundredths

0.03



1.08

5. fifteen hundredths

0.15

8. fifty-one hundredths

0.51



2.70

6. one and forty-seven hundredths

1.47

9. six and two hundredths

6.02

Write each decimal in words. See margin.

- |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|
| 10. 0.46 | 11. 0.07 | 12. 5.03 | 13. 8.36 | 14. 0.81 | 15. 1.20 | 16. 3.16 |
| 17. 2.54 | 18. 0.36 | 19. 1.08 | 20. 3.33 | 21. 7.40 | 22. 2.85 | 23. 4.06 |

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Set 104

1. 4 ones
2. 4 tenths
3. 4 tens
4. 4 hundredths
5. 4 hundreds
6. 4 hundredths
7. 4 tenths
8. 4 ones

**Set 104** pages 282–283 Tell what the 4 means in each number. See margin.

1. 34.07
2. 7.45
3. 49.62
4. 92.14
5. 452.7
6. 9.84
7. 16.40
8. 724.02

Which decimals have

9. 6 in the hundredths place?  
211.76 643.8 2.63  
**211.76**
10. 7 in the tenths place?  
72.06 4.73 223.07  
**4.73**
11. 1 in the tenths place?  
37.13 26.51 410.62  
**37.13**
12. 5 in the hundredths place?  
516.72 24.35 259.02  
**24.35**

Write each decimal.

13. 2 tens 3 ones 9 tenths  
**23.9**
14. 6 ones 1 tenth 8 hundredths  
**6.18**
15. 7 ones 2 hundredths  
**7.02**
16. 5 hundreds 2 ones 4 hundredths  
**502.04**

**Set 105** pages 284–285 Write each amount with a dollar sign and a decimal point.

1. 6¢  
**\$0.06**
2. 72¢  
**\$0.72**
3. 16¢  
**\$0.16**
4. 39¢  
**\$0.39**
5. 27 cents  
**\$0.27**
6. 94 cents  
**\$0.94**
7. 50 cents  
**\$0.50**
8. 8 cents  
**\$0.08**
9. nineteen cents  
**\$0.19**
10. three cents  
**\$0.03**
11. thirty cents  
**\$0.30**
12. seventy-five cents  
**\$0.75**

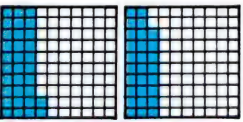

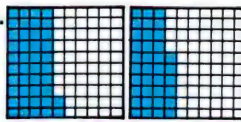
Write each amount with a cent sign.

13. \$0.05  
**5¢**
14. \$0.80  
**80¢**
15. \$0.44  
**44¢**
16. \$0.71  
**71¢**
17. \$0.16  
**16¢**
18. \$0.23  
**23¢**
19. \$0.09  
**9¢**

**Set 106** pages 286–287 Write an equal decimal for

1. 0.70 in tenths  
**0.7**
2. 3.6 in hundredths  
**3.60**
3. 6.80 in tenths  
**6.8**
4. 9.1 in hundredths  
**9.10**

Write two number sentences to compare each decimal. Use < and >.

5.   
**0.32 > 0.28, 0.28 < 0.32**
6.   
**0.6 < 0.7, 0.7 > 0.6**
7.   
**0.43 > 0.36, 0.36 < 0.43**

Compare the decimals. Use <, >, or =.

8. 0.4 ● 0.2  
**>**
9. 7.6 ● 7.2  
**>**
10. 2.6 ● 2.60  
**=**
11. 0.37 ● 0.61  
**<**
12. 0.62 ● 0.58  
**>**
13. 1.34 ● 0.34  
**>**
14. 35.62 ● 35.66  
**<**
15. 32.20 ● 32.02  
**>**
16. 38.6 ● 36.8  
**>**
17. 45.16 ● 44.61  
**>**
18. 16.4 ● 16.42  
**<**
19. 10.1 ● 10.10  
**=**
20. 21.60 ● 21.7  
**<**
21. 63.60 ● 36.06  
**>**
22. 23.02 ● 21.03  
**>**
23. 52.9 ● 52.89  
**>**



# MORE PRACTICE

## Set 107 pages 288-289

- |  |  |   |  |   |  |
|--|--|---|--|---|--|
| 1. $\begin{array}{r} 0.2 \\ + 0.3 \\ \hline 0.5 \end{array}$     | 2. $\begin{array}{r} 7.3 \\ + 5.6 \\ \hline 12.9 \end{array}$      | 3. $\begin{array}{r} 2.7 \\ + 9.6 \\ \hline 12.3 \end{array}$       | 4. $\begin{array}{r} 46.3 \\ + 24.2 \\ \hline 70.5 \end{array}$    | 5. $\begin{array}{r} 56.7 \\ + 52.9 \\ \hline 109.6 \end{array}$    | 6. $\begin{array}{r} 0.29 \\ + 0.18 \\ \hline 0.47 \end{array}$      |
| 7. $\begin{array}{r} 0.61 \\ + 0.49 \\ \hline 1.10 \end{array}$  | 8. $\begin{array}{r} 2.48 \\ + 6.31 \\ \hline 8.79 \end{array}$    | 9. $\begin{array}{r} 5.87 \\ + 6.14 \\ \hline 12.01 \end{array}$    | 10. $\begin{array}{r} 3.62 \\ + 5.99 \\ \hline 9.61 \end{array}$   | 11. $\begin{array}{r} 12.46 \\ + 16.32 \\ \hline 28.78 \end{array}$ | 12. $\begin{array}{r} 82.13 \\ + 17.89 \\ \hline 100.02 \end{array}$ |
| 13. $\begin{array}{r} 7.26 \\ + 0.47 \\ \hline 7.73 \end{array}$ | 14. $\begin{array}{r} 10.73 \\ + 6.43 \\ \hline 17.16 \end{array}$ | 15. $\begin{array}{r} 62.03 \\ + 24.98 \\ \hline 87.01 \end{array}$ | 16. $\begin{array}{r} 0.02 \\ + 25.09 \\ \hline 25.11 \end{array}$ | 17. $\begin{array}{r} 70.27 \\ + 28.75 \\ \hline 99.02 \end{array}$ | 18. $\begin{array}{r} 36.84 \\ + 75.57 \\ \hline 112.41 \end{array}$ |
| 19. $38 + 12.93$<br><b>50.93</b>                                 | 20. $0.38 + 19.54$<br><b>19.92</b>                                 | 21. $9 + 34.06$<br><b>43.06</b>                                     | 22. $0.6 + 4.7 + 7$<br><b>12.3</b>                                 |   |  |
| 23. $2 + 1.36 + 0.70$<br><b>4.06</b>                             | 24. $0.46 + 1.13 + 4$<br><b>5.59</b>                               | 25. $0.98 + 0.24 + 8$<br><b>9.22</b>                                | 26. $0.58 + 1.43 + 0.72$<br><b>2.73</b>                            |   |  |

## Set 108 pages 290-291

- |  |  |  |  |   |   |
|--|--|--|--|---|---|
| 1. $\begin{array}{r} 8.8 \\ - 4.7 \\ \hline 4.1 \end{array}$       | 2. $\begin{array}{r} 6.3 \\ - 2.1 \\ \hline 4.2 \end{array}$       | 3. $\begin{array}{r} 9.4 \\ - 7.3 \\ \hline 2.1 \end{array}$       | 4. $\begin{array}{r} 6.4 \\ - 2.7 \\ \hline 3.7 \end{array}$       | 5. $\begin{array}{r} 8.3 \\ - 6.8 \\ \hline 1.5 \end{array}$        | 6. $\begin{array}{r} 5.7 \\ - 3.9 \\ \hline 1.8 \end{array}$        |
| 7. $\begin{array}{r} 18.3 \\ - 5.6 \\ \hline 12.7 \end{array}$     | 8. $\begin{array}{r} 16.1 \\ - 0.8 \\ \hline 15.3 \end{array}$     | 9. $\begin{array}{r} 3.62 \\ - 0.38 \\ \hline 3.24 \end{array}$    | 10. $\begin{array}{r} 9.17 \\ - 2.93 \\ \hline 6.24 \end{array}$   | 11. $\begin{array}{r} 6.02 \\ - 1.84 \\ \hline 4.18 \end{array}$    | 12. $\begin{array}{r} 8.22 \\ - 4.86 \\ \hline 3.36 \end{array}$    |
| 13. $\begin{array}{r} 23.72 \\ - 2.61 \\ \hline 21.11 \end{array}$ | 14. $\begin{array}{r} 38.17 \\ - 5.64 \\ \hline 32.53 \end{array}$ | 15. $\begin{array}{r} 53.92 \\ - 7.87 \\ \hline 46.05 \end{array}$ | 16. $\begin{array}{r} 20.32 \\ - 11.94 \\ \hline 8.38 \end{array}$ | 17. $\begin{array}{r} 34.12 \\ - 10.05 \\ \hline 24.07 \end{array}$ | 18. $\begin{array}{r} 29.36 \\ - 12.07 \\ \hline 17.29 \end{array}$ |
| 19. $8.3 - 4.7$<br><b>3.6</b>                                      | 20. $36.13 - 8$<br><b>28.13</b>                                    | 21. $4.82 - 0.93$<br><b>3.89</b>                                   | 22. $6 - 3.26$<br><b>2.74</b>                                      | 23. $9 - 0.87$<br><b>8.13</b>                                       |   |
| 24. $46 - 2.82$<br><b>43.18</b>                                    | 25. $58 - 14.92$<br><b>43.08</b>                                   | 26. $26 - 23.45$<br><b>2.55</b>                                    | 27. $41.29 - 28$<br><b>13.29</b>                                   | 28. $24.17 - 18.96$<br><b>5.21</b>                                  |   |

## Set 109 pages 292-293 Tell whether you would add or subtract. Then find the answer.

- Claudia bought a basketball on sale for \$8.99. The basketball sold for \$12.00 before the sale. How much money did Claudia save at the sale?  
**Subtract. \$3.01**
- Takashi weighs 35.6 kilograms. His dog weighs 12.8 kilograms. How much more does Takashi weigh than his dog?  
**Subtract. 22.8 more kilograms**
- Sandy babysat 23.5 hours in March and 19 hours in April. How many more hours did she babysit in March than in April?  
**Subtract. 4.5 more hours**
- Lucy bought 3 hair ribbons. One ribbon cost \$0.98, one ribbon cost \$1.29, and one ribbon cost \$1.09. How much did the ribbons cost altogether?  
**Add. \$3.36**



Set 111

10. One third
11. Three fifths
12. Two sixths
13. Five sixths
14. Six eighths
15. One fifth
16. Three fourths
17. Seven ninths
18. Five eighths
19. Four sevenths

Set 110 pages 296–297 Solve each problem.

1. Roberto bicycled 6.8 miles in 1.75 hours on Monday. He bicycled 4.6 miles in 1 hour on Tuesday. How many miles did he bicycle in all.

11.4 miles

3. Everett spent \$7.50 for an album, \$16.34 for a sweater, and \$12.98 for a shirt. How much did he spend for the shirt and sweater?

\$29.32

2. Vicky bought 9 yards of red fabric and 6 yards of green fabric. She used 2.6 yards of green fabric. How much green fabric did she have left?

3.4 yards

4. Nate collected cans weighing 3.5 kilograms on Monday, 1 kilogram on Tuesday, and 1.7 kilograms on Wednesday. How many more kilograms did he collect on Monday than on Wednesday?

1.8 more kilograms

Set 111 pages 302–303 Write a fraction to show how much of the figure is shaded.



Write each fraction.

5. three fourths  $\frac{3}{4}$
6. one seventh  $\frac{1}{7}$
7. two thirds  $\frac{2}{3}$
8. four fourths  $\frac{4}{4}$
9. six tenths  $\frac{6}{10}$

Write each fraction in words. See margin.

10.  $\frac{1}{3}$
11.  $\frac{5}{6}$
12.  $\frac{3}{6}$
13.  $\frac{5}{6}$
14.  $\frac{8}{10}$
15.  $\frac{1}{5}$
16.  $\frac{4}{10}$
17.  $\frac{7}{9}$
18.  $\frac{8}{10}$
19.  $\frac{4}{7}$

Set 112 pages 304–305 What fraction of the

1. animals are ducks?  $\frac{2}{3}$



3. letters are rs?  $\frac{4}{7}$



5. balloons are red?  $\frac{3}{5}$



2. doors are open?  $\frac{1}{2}$



4. shapes are square?  $\frac{2}{10}$



6. cups are full?  $\frac{2}{4}$



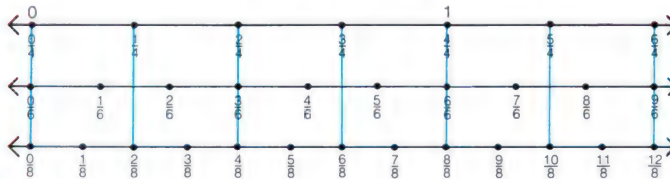


# MORE PRACTICE

**Set 113** pages 306-307 Compare the fractions. Use  $<$  or  $>$ .

1.  $\frac{4}{10} \bullet \frac{1}{4}$   $>$
2.  $\frac{7}{9} \bullet \frac{7}{9}$   $=$
3.  $\frac{3}{10} \bullet \frac{4}{10}$   $<$
4.  $\frac{6}{10} \bullet \frac{1}{3}$   $>$
5.  $\frac{6}{9} \bullet \frac{7}{9}$   $<$
6.  $\frac{14}{15} \bullet \frac{12}{15}$   $>$
7.  $\frac{13}{14} \bullet \frac{14}{14}$   $<$
8.  $\frac{7}{10} \bullet \frac{3}{10}$   $>$
9.  $\frac{9}{10} \bullet \frac{4}{10}$   $>$
10.  $\frac{1}{7} \bullet \frac{3}{7}$   $<$
11.  $\frac{9}{10} \bullet \frac{3}{10}$   $>$
12.  $\frac{10}{4} \bullet \frac{1}{4}$   $>$
13.  $\frac{7}{11} \bullet \frac{17}{11}$   $<$
14.  $\frac{6}{10} \bullet \frac{8}{10}$   $<$

Use the number lines to compare the fractions. Use  $<$ ,  $>$ , or  $=$ .



15.  $\frac{4}{10} \bullet \frac{3}{10}$   $>$
16.  $\frac{1}{4} \bullet \frac{1}{4}$   $=$
17.  $\frac{1}{10} \bullet \frac{3}{10}$   $<$
18.  $\frac{5}{10} \bullet \frac{6}{10}$   $<$
19.  $\frac{3}{10} \bullet \frac{7}{10}$   $<$
20.  $\frac{10}{10} \bullet \frac{1}{10}$   $>$
21.  $\frac{5}{10} \bullet \frac{10}{10}$   $<$
22.  $\frac{4}{10} \bullet \frac{3}{10}$   $>$
23.  $\frac{3}{10} \bullet \frac{4}{10}$   $<$
24.  $\frac{1}{4} \bullet \frac{1}{4}$   $=$
25.  $\frac{7}{10} \bullet \frac{7}{10}$   $=$
26.  $\frac{3}{10} \bullet \frac{6}{10}$   $<$
27.  $\frac{10}{10} \bullet \frac{4}{10}$   $>$
28.  $\frac{11}{10} \bullet \frac{6}{10}$   $>$

Compare each fraction with 1. Use  $<$ ,  $>$ , or  $=$ .

29.  $\frac{4}{10} \bullet 1$   $<$
30.  $\frac{10}{10} \bullet 1$   $=$
31.  $\frac{5}{10} \bullet 1$   $<$
32.  $\frac{7}{10} \bullet 1$   $<$
33.  $\frac{10}{10} \bullet 1$   $=$
34.  $\frac{6}{4} \bullet 1$   $>$
35.  $\frac{3}{10} \bullet 1$   $<$

**Set 114** pages 308-309 Write each mixed number.

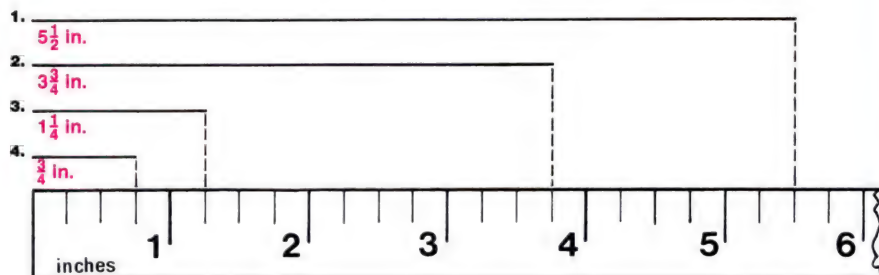
1. one and two fifths  $1\frac{2}{5}$
2. seven and one third  $7\frac{1}{3}$
3. four and three eighths  $4\frac{3}{8}$
4. six and four sixths  $6\frac{4}{6}$
5. five and two fourths  $5\frac{2}{4}$
6. eight and four fifths  $8\frac{4}{5}$

Write a fraction and a mixed number for each picture.

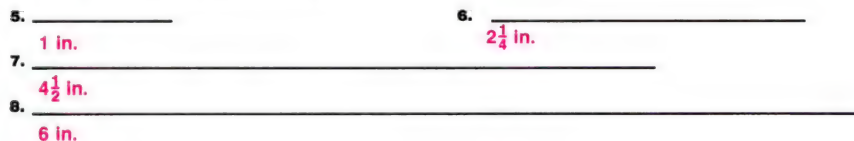




**Set 115** pages 310–311 Give the length of each segment.



Use a ruler to measure each segment.



**Set 116** pages 312–313 Find each answer.

- |                                      |                                      |                                     |                                      |                                      |                                      |
|--------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| 1. $\frac{1}{3}$ of 27<br><b>9</b>   | 2. $\frac{1}{2}$ of 12<br><b>6</b>   | 3. $\frac{1}{5}$ of 25<br><b>5</b>  | 4. $\frac{1}{8}$ of 40<br><b>5</b>   | 5. $\frac{1}{4}$ of 36<br><b>9</b>   | 6. $\frac{1}{3}$ of 6<br><b>2</b>    |
| 7. $\frac{1}{5}$ of 20<br><b>4</b>   | 8. $\frac{1}{6}$ of 30<br><b>5</b>   | 9. $\frac{1}{2}$ of 42<br><b>21</b> | 10. $\frac{1}{4}$ of 12<br><b>3</b>  | 11. $\frac{1}{8}$ of 64<br><b>8</b>  | 12. $\frac{1}{3}$ of 21<br><b>7</b>  |
| 13. $\frac{1}{2}$ of 52<br><b>26</b> | 14. $\frac{1}{3}$ of 90<br><b>30</b> | 15. $\frac{1}{8}$ of 56<br><b>7</b> | 16. $\frac{1}{5}$ of 75<br><b>15</b> | 17. $\frac{1}{4}$ of 96<br><b>24</b> | 18. $\frac{1}{6}$ of 78<br><b>13</b> |

**Set 117** pages 314–315 Solve each problem. Draw a picture to help you.

- |   |  |
|---|--|
| 1. In Jody's garden, $\frac{2}{3}$ of the 18 flowers are roses. How many of the flowers are roses?<br><b>12 flowers</b>         | 2. It rained on $\frac{3}{5}$ of the 30 days in April. How many days did it rain in April?<br><b>18 days</b>                         |
| 3. On Hickory Road, $\frac{5}{6}$ of the 36 parked cars were yellow. How many of the parked cars were yellow?<br><b>30 cars</b> | 4. Dr. Zabin examined 32 pets on Saturday. If $\frac{3}{4}$ of the pets were dogs, how many of the pets were dogs?<br><b>24 pets</b> |
| 5. Don made $\frac{4}{5}$ of his 10 free throws. How many free throws did he make?<br><b>8 free throws</b>                      | 6. If $\frac{1}{6}$ of the 6 musicians in the band played drums, how many musicians played drums?<br><b>1 musician</b>               |



# MORE PRACTICE

Set 118 pages 316-317

1.  $\frac{1}{7} + \frac{2}{7} = \frac{3}{7}$
2.  $\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$
3.  $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$
4.  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$
5.  $\frac{3}{5} + \frac{2}{5} = \frac{5}{5} = 1$
6.  $\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$
7.  $\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1\frac{1}{4}$
8.  $\frac{3}{9} + \frac{5}{9} = \frac{8}{9}$
9.  $\frac{1}{6} + \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$
10.  $\frac{2}{3} + \frac{2}{3} = \frac{4}{3} = 1\frac{1}{3}$
11.  $\frac{4}{3} + \frac{2}{3} = \frac{6}{3} = 2$
12.  $\frac{5}{6} + \frac{5}{6} = \frac{10}{6} = 1\frac{2}{3}$
13.  $\frac{1}{7} + \frac{4}{7} = \frac{5}{7}$
14.  $\frac{6}{9} + \frac{7}{9} = \frac{13}{9} = 1\frac{4}{9}$
15.  $\frac{7}{8} + \frac{2}{8} = \frac{9}{8} = 1\frac{1}{8}$
16.  $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$
17.  $\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$
18.  $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$
19.  $\frac{4}{9} + \frac{4}{9} = \frac{8}{9}$
20.  $\frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$
21.  $\frac{3}{8} + \frac{9}{8} = \frac{12}{8} = 1\frac{3}{2} = 1\frac{1}{2}$
22.  $\frac{3}{10} + \frac{8}{10} = \frac{11}{10} = 1\frac{1}{10}$
23.  $\frac{7}{8} + \frac{8}{8} = \frac{15}{8} = 1\frac{7}{8}$
24.  $\frac{9}{12} + \frac{6}{12} = \frac{15}{12} = 1\frac{1}{4}$
25.  $\frac{3}{6} + \frac{4}{6} = \frac{7}{6} = 1\frac{1}{6}$
26.  $\frac{5}{10} + \frac{9}{10} = \frac{14}{10} = 1\frac{2}{5}$
27.  $\frac{5}{5} + \frac{5}{5} = \frac{10}{5} = 2$
28.  $\frac{4}{12} + \frac{7}{12} = \frac{11}{12}$

Set 119 pages 318-319 Use the number lines to help you find equal fractions.

1.  $\frac{4}{8} = \frac{1}{2}$
2.  $\frac{4}{4} = \frac{2}{2} = 1$
3.  $\frac{1}{2} = \frac{2}{4}$
4.  $\frac{2}{4} = \frac{4}{8}$
5.  $\frac{1}{4} = \frac{2}{8}$
6.  $\frac{2}{8} = \frac{4}{16}$
7.  $\frac{8}{8} = \frac{4}{4} = 1$
8.  $\frac{6}{8} = \frac{3}{4}$
9.  $\frac{2}{3} = \frac{8}{12}$
10.  $\frac{6}{12} = \frac{2}{4}$
11.  $\frac{3}{4} = \frac{9}{12}$
12.  $\frac{0}{4} = \frac{0}{3}$
13.  $\frac{4}{12} = \frac{1}{3}$
14.  $\frac{3}{3} = \frac{12}{12} = 1$
15.  $\frac{3}{12} = \frac{1}{4}$
16.  $\frac{12}{12} = \frac{4}{4} = 1$

Set 120 pages 320-321 Add. Use the number lines above.

1.  $\frac{1}{3} + \frac{5}{12} = \frac{9}{12} = \frac{3}{4}$
2.  $\frac{2}{3} + \frac{2}{12} = \frac{10}{12} = \frac{5}{6}$
3.  $\frac{1}{8} + \frac{1}{4} = \frac{3}{8}$
4.  $\frac{0}{6} + \frac{5}{12} = \frac{5}{12}$
5.  $\frac{5}{6} + \frac{2}{12} = \frac{12}{12} = 1$
6.  $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$
7.  $\frac{1}{6} + \frac{9}{12} = \frac{11}{12}$
8.  $\frac{2}{8} + \frac{5}{12} = \frac{8}{12} = \frac{2}{3}$
9.  $\frac{3}{4} + \frac{7}{8} = \frac{13}{8} = 1\frac{5}{8}$
10.  $\frac{4}{4} + \frac{3}{12} = \frac{15}{12} = 1\frac{1}{4}$
11.  $\frac{4}{6} + \frac{7}{12} = \frac{15}{12} = 1\frac{1}{4}$
12.  $\frac{3}{8} + \frac{2}{4} = \frac{7}{8}$
13.  $\frac{2}{3} + \frac{2}{12} = \frac{10}{12} = \frac{5}{6}$
14.  $\frac{1}{8} + \frac{3}{4} = \frac{7}{8}$
15.  $\frac{6}{8} + \frac{1}{4} = \frac{8}{8} = 1$
16.  $\frac{3}{12} + \frac{4}{8} = \frac{9}{12} = \frac{3}{4}$
17.  $\frac{1}{8} + \frac{3}{6} = \frac{5}{6}$
18.  $\frac{6}{8} + \frac{2}{12} = \frac{11}{12}$



**Set 121** pages 322-323


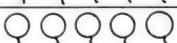


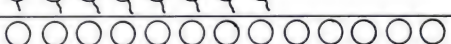
1.  $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$
2.  $\frac{7}{9} - \frac{2}{9} = \frac{5}{9}$
3.  $\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$
4.  $\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$
5.  $\frac{1}{6} - \frac{0}{6} = \frac{1}{6}$
6.  $\frac{3}{3} - \frac{2}{3} = \frac{1}{3}$
7.  $\frac{9}{10} - \frac{5}{10} = \frac{4}{10}$
8.  $\frac{3}{6} - \frac{1}{6} = \frac{2}{6}$
9.  $\frac{6}{7} - \frac{5}{7} = \frac{1}{7}$
10.  $\frac{8}{5} - \frac{3}{5} = \frac{5}{5}$
11.  $\frac{3}{3} - \frac{2}{3} = \frac{1}{3}$
12.  $\frac{8}{9} - \frac{6}{9} = \frac{2}{9}$
13.  $\frac{5}{4} - \frac{2}{4} = \frac{3}{4}$
14.  $\frac{11}{12} - \frac{5}{12} = \frac{6}{12}$
15.  $\frac{7}{8} - \frac{4}{8} = \frac{3}{8}$
16.  $\frac{10}{12} - \frac{3}{12} = \frac{7}{12}$
17.  $\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$
18.  $\frac{5}{5} - \frac{3}{5} = \frac{2}{5}$
19.  $\frac{4}{7} - \frac{4}{7} = \frac{0}{7}$
20.  $\frac{8}{10} - \frac{0}{10} = \frac{8}{10}$
21.  $\frac{2}{4} - \frac{1}{4} = \frac{1}{4}$


**Set 122** pages 324-325 Subtract. Use the number lines on page 394.

1.  $\frac{2}{4} - \frac{2}{4} = \frac{0}{4}$
2.  $\frac{6}{8} - \frac{4}{8} = \frac{2}{8}$
3.  $\frac{9}{12} - \frac{3}{12} = \frac{6}{12}$
4.  $\frac{3}{6} - \frac{1}{6} = \frac{2}{6}$
5.  $\frac{1}{4} - \frac{1}{12} = \frac{2}{12}$
6.  $\frac{8}{12} - \frac{3}{12} = \frac{5}{12}$
7.  $\frac{2}{4} - \frac{3}{8} = \frac{1}{8}$
8.  $\frac{5}{8} - \frac{1}{4} = \frac{3}{8}$
9.  $\frac{7}{8} - \frac{2}{4} = \frac{3}{8}$
10.  $\frac{4}{6} - \frac{5}{12} = \frac{3}{12}$
11.  $\frac{8}{8} - \frac{3}{4} = \frac{2}{8}$
12.  $\frac{5}{12} - \frac{2}{6} = \frac{1}{12}$
13.  $\frac{11}{12} - \frac{0}{6} = \frac{11}{12}$
14.  $\frac{4}{6} - \frac{1}{3} = \frac{2}{6}$
15.  $\frac{8}{12} - \frac{6}{12} = \frac{2}{12}$
16.  $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$
17.  $\frac{11}{12} - \frac{8}{12} = \frac{3}{12}$
18.  $\frac{6}{12} - \frac{2}{4} = \frac{0}{12}$
19.  $\frac{7}{8} - \frac{3}{4} = \frac{1}{8}$
20.  $\frac{5}{12} - \frac{5}{12} = \frac{0}{12}$
21.  $\frac{2}{4} - \frac{1}{8} = \frac{3}{8}$

**Set 123** pages 332-333 This pictograph shows the number of balloons sold at the zoo.

Number of Balloons Sold at the Zoo

|           |   |
|-----------|---|
| Monday    |  |
| Tuesday   |  |
| Wednesday |  |
| Thursday  |  |
| Friday    |  |

Each  means 8 balloons.

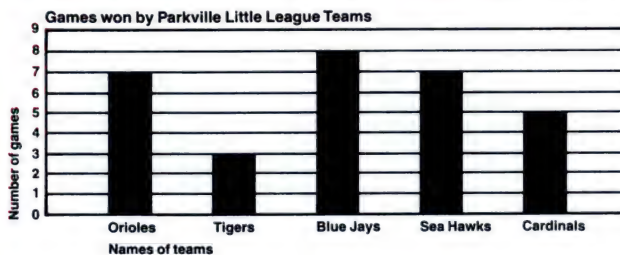
How many balloons were sold on

1. Monday? **64**
2. Tuesday? **40**
3. Wednesday? **32**
4. Thursday? **64**
5. Friday? **104**
6. On which day were the most balloons sold?  
**Friday**
7. On which day were the least balloons sold?  
**Wednesday**
8. On which days were the same number of balloons sold?  
**Monday, Thursday**
9. How many balloons were sold on Tuesday and Wednesday?  
**72 balloons**



# MORE PRACTICE

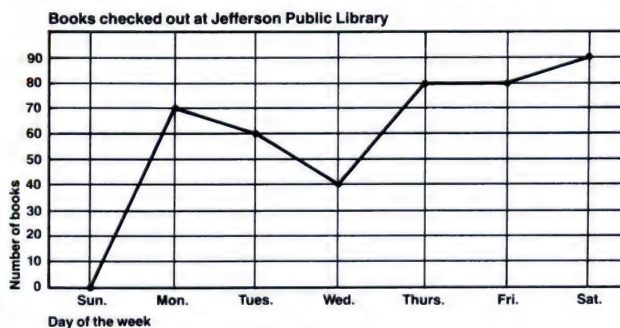
**Set 124** pages 334-335 Use the bar graph below to find each answer.



How many games were won by the

- Orioles? **7**
- Tigers? **3**
- Blue Jays? **8**
- Sea Hawks? **7**
- Cardinals? **5**
- Which teams won more than 6 games?  
**Orioles, Blue Jays, Sea Hawks**
- Which teams won the same number of games?  
**Orioles, Sea Hawks**
- Which team won fewer than 4 games?  
**Tigers**
- Which team won the most games?  
**Blue Jays**

**Set 125** pages 336-337 Use the broken-line graph below to answer each question.

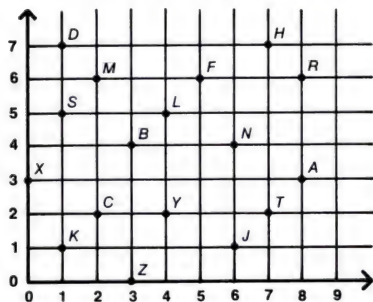


How many books were checked out on

- Sunday? **0**
- Monday? **70**
- Tuesday? **60**
- Wednesday? **40**
- Thursday? **80**
- Friday? **80**
- On which day was the greatest number of books checked out?  
**Saturday**
- On which days was the same number of books checked out?  
**Thursday, Friday**
- On which day were 40 books checked out?  
**Wednesday**
- On which day was the least number of books checked out?  
**Sunday**



**Set 126** pages 340-341 Write the letter that names the point located by each number pair. Use the grid below.



1. (6, 4) **N**
2. (2, 2) **C**
3. (0, 3) **X**
4. (1, 7) **D**
5. (5, 6) **F**
6. (4, 2) **Y**
7. (7, 7) **H**

Write the number pair that gives the location named by each letter. Use the grid above.

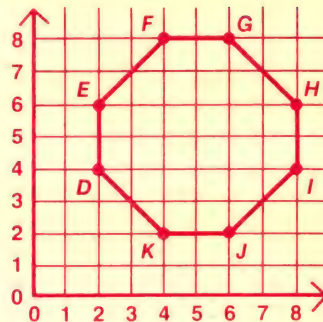
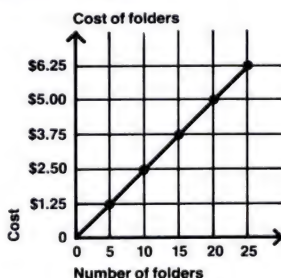
8. **B** (3, 4)
9. **R** (8, 6)
10. **T** (7, 2)
11. **Z** (3, 0)
12. **K** (1, 1)
13. **L** (4, 5)
14. **J** (6, 1)
15. **M** (2, 6)
16. **A** (8, 3)
17. **S** (1, 5)

**Set 127** pages 342-343 Number a grid for Exercises 1-8. Then graph and label the points located by the number pairs given. Connect the points as directed. **See margin.**

1. **D** (2, 4)
2. **E** (2, 6)  
Connect **D** and **E**
3. **F** (4, 8)  
Connect **E** and **F**
4. **G** (6, 8)  
Connect **F** and **G**
5. **H** (8, 6)  
Connect **G** and **H**
6. **I** (8, 4)  
Connect **H** and **I**
7. **J** (6, 2)  
Connect **I** and **J**
8. **K** (4, 2)  
Connect **J** and **K**  
Connect **D** and **K**

**Set 128** pages 344-345 Use the graph below to solve each problem.

1. Carl spent \$3.75 for folders. How many folders did he buy?  
**15 folders**
2. Beth bought 25 folders. How much did she spend on folders?  
**\$6.25**
3. Casey bought 5 folders. How much change did he receive from \$5.00?  
**\$3.75**
4. Gail bought 15 folders. Georgina bought 25 folders. How much more did Georgina spend for folders than Gail?  
**\$2.50 more**





## Maintenance

Use anytime after chapter 1. The skills required to do this Maintenance page have been taught prior to page 22.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. For Problems 53, 54, and 56 students should choose to compute mentally because these problems involve basic facts. Problems 55, 57, and 58, involve addition and subtraction of whole numbers with renaming which was presented in Grade 3, but has not been reviewed in Grade 4 yet. Some students may choose to compute their answers to these problems with a calculator, some may choose to use paper and pencil, and others may choose to compute mentally.

For a discussion of when to choose mental math and when to choose a calculator, see pages 444-445 and pages 450-451 of this Teacher's Edition.

## MAINTENANCE

Add or subtract.

$$\begin{array}{r} 1. \quad 15 \\ - 7 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 2. \quad 3 \\ - 3 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 3. \quad 7 \\ + 8 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 4. \quad 5 \\ + 9 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 5. \quad 10 \\ - 6 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 6. \quad 8 \\ - 1 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 7. \quad 4 \\ + 3 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8. \quad 7 \\ + 2 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 9. \quad 8 \\ + 5 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 10. \quad 9 \\ + 9 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 11. \quad 17 \\ - 8 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 12. \quad 15 \\ - 9 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 13. \quad 11 \\ - 8 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 14. \quad 5 \\ - 0 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 15. \quad 4 \\ + 7 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 16. \quad 5 \\ + 5 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 17. \quad 8 \\ - 5 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 18. \quad 13 \\ - 8 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 19. \quad 2 \\ + 2 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 20. \quad 6 \\ + 5 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 21. \quad 9 \\ - 3 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 22. \quad 6 \\ - 4 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 23. \quad 3 \\ + 8 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 24. \quad 6 \\ + 7 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 25. \quad 7 \\ + 7 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 26. \quad 0 \\ + 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 27. \quad 12 \\ - 7 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 28. \quad 11 \\ - 2 \\ \hline 9 \end{array}$$

$$29. \quad 6 + 6$$

$$30. \quad 2 + 9$$

$$31. \quad 3 + 6$$

$$32. \quad 5 + 2$$

$$33. \quad 8 - 4$$

$$34. \quad 12 - 4$$

$$35. \quad 16 - 7$$

$$36. \quad 14 - 9$$

$$37. \quad 5 + 4$$

$$38. \quad 7 + 5$$

$$39. \quad 9 + 8$$

$$40. \quad 9 + 1$$

$$41. \quad 11 - 4$$

$$42. \quad 10 - 2$$

$$43. \quad 1 + 5$$

$$44. \quad 9 + 3$$

$$45. \quad 8 + 0$$

$$46. \quad 9 - 9$$

$$47. \quad 14 - 5$$

$$48. \quad 13 - 7$$

$$49. \quad 9 + 7$$

$$50. \quad 16 - 8$$

$$51. \quad 6 + 8$$

$$52. \quad 9 + 6$$

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math

Use the best method to solve each problem. Tell which method you used.

53. Carl ate 11 carrot sticks. Ann ate 6 carrot sticks. How many more did Carl eat than Ann?

**5 more carrot sticks**

55. Carl collected 16 wildflowers. Sue collected 24 wildflowers. Who collected the greatest number of wildflowers?

**Sue**

57. The Roberts family drove 48 miles to the picnic. The Martinez family drove 29 miles. How much farther did the Roberts family drive?

**19 miles**

54. The family ate 5 oranges, 4 apples and 7 bananas at the picnic. How many pieces of fruit did they eat?

**16 pieces**

56. The Roberts family brought 12 sandwiches to the picnic. They ate 8 of the sandwiches. How many were left?

**4 sandwiches**

58. Friday, 83 children came to the park. Saturday, 99 children came. Sunday, 121 children came. How many children came to the park in all?

**303 children**



# MAINTENANCE

Add or subtract.

- |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. $8 + 7$<br><b>15</b>  | 2. $4 + 5$<br><b>9</b>   | 3. $17 - 8$<br><b>9</b>  | 4. $16 - 9$<br><b>7</b>  | 5. $6 + 9$<br><b>15</b>  | 6. $4 + 7$<br><b>11</b>  |
| 7. $14 - 6$<br><b>8</b>  | 8. $12 - 3$<br><b>9</b>  | 9. $9 + 7$<br><b>16</b>  | 10. $11 - 4$<br><b>7</b> | 11. $12 - 7$<br><b>5</b> | 12. $9 + 3$<br><b>12</b> |
| 13. $11 - 8$<br><b>3</b> | 14. $9 + 9$<br><b>18</b> | 15. $6 + 7$<br><b>13</b> | 16. $15 - 7$<br><b>8</b> | 17. $9 - 3$<br><b>6</b>  | 18. $7 + 7$<br><b>14</b> |
| 19. $5 + 5$<br><b>10</b> | 20. $17 - 9$<br><b>8</b> | 21. $8 + 8$<br><b>16</b> | 22. $10 - 3$<br><b>7</b> | 23. $11 - 5$<br><b>6</b> | 24. $4 + 9$<br><b>13</b> |

Compare the numbers. Use  $<$  or  $>$ .

- |   |   |   |
|---|---|---|
| 25. $35 \bullet 29$<br><b><math>&gt;</math></b>   | 26. $64 \bullet 67$<br><b><math>&lt;</math></b>       | 27. $329 \bullet 327$<br><b><math>&gt;</math></b>     |
| 28. $584 \bullet 482$<br><b><math>&gt;</math></b> | 29. $4,638 \bullet 4,724$<br><b><math>&lt;</math></b> | 30. $7,372 \bullet 7,360$<br><b><math>&gt;</math></b> |

Write the numbers in order from least to greatest.

- |                                       |                                       |   |
|---------------------------------------|---------------------------------------|---|
| 31. 56 47 39<br><b>39 47 56</b>       | 32. 84 93 81<br><b>81 84 93</b>       | 33. 30 39 35 32<br><b>30 32 35 39</b>             |
| 34. 354 362 360<br><b>354 360 362</b> | 35. 746 731 738<br><b>731 738 746</b> | 36. 1,473 1,186 1,452<br><b>1,186 1,452 1,473</b> |

## Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math,

Use the best method to solve each problem. Tell which method you used.

- |   |   |
|---|---|
| 37. Michelle had 45 dollars before she went shopping. She spent 18 dollars. How much money did she have left after shopping?<br><b>27 dollars</b> | 38. There were 8 puppies in Jerry's Pet Shop. The shop received 9 more puppies. How many puppies were in the shop then?<br><b>17 puppies</b>        |
| 39. Mary Kay has 235 stamps in her collection. Susanne has 342 stamps in her collection. Which girl has more stamps?<br><b>Susanne</b>            | 40. Janet had 59 marbles. Sam gave her some more. Now she has 115 marbles. How many marbles did Sam give her?<br><b>56 marbles</b>                  |
| 41. Andrea made 6 posters for the fair. Rich made 5 posters. How many posters did Andrea and Rich make in all?<br><b>11 posters</b>               | 42. On his vacation, Craig spent 3 days traveling, 6 days camping, and 7 days at a lake resort. How many days was he on vacation?<br><b>16 days</b> |

Use after Chapter 2. 399

## Maintenance

Use anytime after chapter 2. The skills required to do this Maintenance page have been taught prior to page 50.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. Students should choose to compute mentally in Problems 38, 39, 41, and 42. Problems 37 and 40 involve addition and subtraction of whole numbers with renaming which was presented in Grade 3, but has not been reviewed in Grade 4 yet. Some students may choose to compute their answers to these problems with a calculator, some may choose paper and pencil, and others may choose to compute mentally.



## Maintenance

Use anytime after chapter 3. The skills required to do this Maintenance page have been taught prior to page 86.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. Students should choose to find the answer to Problem 26 mentally. For Problems 29 and 30, only an estimate is required.

For a discussion of when to choose mental math and when to choose a calculator, see pages 444-445 and pages 450-451 of this Teacher's Edition.

## MAINTENANCE

Tell what the 4 means in each number. **2. 4 hundred-thousands**

1. 154,112

**4 thousands**

2. 407,286

**See above.**

3. 27,481

**4 hundreds**

4. 4,579,301

**4 millions**

Write the standard form.

5. nine thousand, nine hundred nine  
**9,909**

6. six hundred-thousand, thirty-five  
**600,035**

7. five million, sixteen thousand, four hundred twenty-three  
**5,016,423**

8. seventy-one thousand, six hundred thirteen  
**71,613**

Round each number to the nearest ten.

9. 57  
**60**

10. 25  
**30**

11. 82  
**80**

12. 178  
**180**

13. 314  
**310**

14. 735  
**740**

Round each number to the nearest hundred.

15. 829  
**800**

16. 352  
**400**

17. 462  
**500**

18. 7,346  
**7,300**

19. 1,092  
**1,100**

20. 2,957  
**3,000**

Round each number to the nearest thousand.

21. 2,502  
**3,000**

22. 8,143  
**8,000**

23. 6,489  
**6,000**

24. 5,924  
**6,000**

25. 7,084  
**7,000**

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

26. There were 13 beavers in the pond. Then 5 beavers moved to another pond. How many were left?  
**8 beavers**

27. There are 85 turtles in the pond, 27 on the bank and 36 in the sand. How many turtles are there in all?  
**148 turtles**

28. There were 31 birds in the yard. Of these, 17 birds were cardinals. How many of the birds were not cardinals?  
**14 birds**

29. Pat must identify 50 birds to earn a merit badge. She saw 24 wrens, 13 robins, and 18 crows. Did she earn her badge?  
**Yes**

30. There were 29 frogs on the bank, and 12 frogs on the log. About how many frogs were there in all?  
**About 40 frogs**

31. There were 53 squirrels and 19 chipmunks in the field. How many more squirrels were there than chipmunks?  
**34 more squirrels**



# MAINTENANCE

Add or subtract.

- |   |   |  |  |  |
|---|---|--|--|--|
| 1. $\begin{array}{r} 36 \\ + 23 \\ \hline 59 \end{array}$         | 2. $\begin{array}{r} 42 \\ + 59 \\ \hline 101 \end{array}$        | 3. $\begin{array}{r} 85 \\ - 41 \\ \hline 44 \end{array}$              | 4. $\begin{array}{r} 635 \\ - 27 \\ \hline 608 \end{array}$                | 5. $\begin{array}{r} 984 \\ + 420 \\ \hline 1,404 \end{array}$               |
| 6. $\begin{array}{r} 537 \\ + 68 \\ \hline 605 \end{array}$       | 7. $\begin{array}{r} 265 \\ + 847 \\ \hline 1,112 \end{array}$    | 8. $\begin{array}{r} 4,035 \\ - 676 \\ \hline 3,359 \end{array}$       | 9. $\begin{array}{r} 8,671 \\ + 5,493 \\ \hline 14,164 \end{array}$        | 10. $\begin{array}{r} 5,000 \\ - 2,368 \\ \hline 2,632 \end{array}$          |
| 11. $\begin{array}{r} 71 \\ 46 \\ + 23 \\ \hline 140 \end{array}$ | 12. $\begin{array}{r} 19 \\ 34 \\ + 87 \\ \hline 140 \end{array}$ | 13. $\begin{array}{r} 206 \\ 741 \\ + 384 \\ \hline 1,331 \end{array}$ | 14. $\begin{array}{r} 2,376 \\ 178 \\ + 3,626 \\ \hline 6,180 \end{array}$ | 15. $\begin{array}{r} 1,307 \\ 4,528 \\ + 3,064 \\ \hline 8,899 \end{array}$ |
| 16. $63 - 22$<br><b>41</b>  | 17. $80 - 54$<br><b>26</b>  | 18. $527 + 35$<br><b>562</b>   |  |  |
| 19. $435 - 19$<br><b>416</b>                                      | 20. $353 + 483$<br><b>836</b>                                     | 21. $4,753 + 208$<br><b>4,961</b>                                      |  |  |
| 22. $6,000 - 2,143$<br><b>3,857</b>                               | 23. $4,376 + 890 + 1,468$<br><b>6,734</b>                         | 24. $5,748 + 455 + 1,849$<br><b>8,052</b>                              |  |  |

## Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

- |  |  |
|--|--|
| 25. Henry had \$20.00. He bought a hat for \$5.73. Did he have enough change to buy a tie for \$15.00?<br><b>No</b>  | 26. Helen saw a skirt for \$9.47 and a blouse for \$8.39. Could she buy both with \$20.00?<br><b>Yes</b>   |
| 27. There were 15,743 tickets sold for a baseball game. Of these, 859 tickets were not used. How many tickets were used?<br><b>14,884</b>                              | 28. Yoshio collected 17 stamps this week. He now has 234 stamps in his collection. How many stamps did Yoshio have last week?<br><b>217 stamps</b>                   |
| 29. When an airplane landed in El Paso, 147 people remained on board and 58 more people got on the plane. How many people were then on the plane?<br><b>205 people</b> | 30. The library now has 673 books. There were 289 new books ordered. The library has space for 950 books. Will there be enough space for the new books?<br><b>No</b> |
| 31. Kelly jogged for 45 minutes. Ann jogged for 10 minutes longer than Kelly. How long did Ann jog?<br><b>55 minutes</b>   | 32. A card store sold 163 birthday cards, 89 get-well cards, and 318 note cards. How many cards were sold in all?<br><b>570 cards</b>                                |

Use after Chapter 4. 401

## Maintenance

Use anytime after chapter 4. The skills required to do this Maintenance page have been taught prior to page 120.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. Students should estimate for Problems 25, 26, and 30. Students should compute their answer to Problem 31 mentally.



## Maintenance

Use anytime after chapter 5. The skills required to do this Maintenance page have been taught prior to page 146.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. In Problem 29, only an estimate is required. Students should find the answer to Problem 30 mentally. Encourage students to compute the answers to Problems 27 and 31 mentally also.

For a discussion of when to choose mental math and when to choose a calculator, see pages 444-445 and pages 450-451 of this Teacher's Edition.

## MAINTENANCE

Add or subtract.

$$\begin{array}{r} 1. \quad 8 \\ + 7 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 2. \quad 13 \\ - 6 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 3. \quad 17 \\ - 9 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 4. \quad 9 \\ + 8 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 5. \quad 15 \\ - 6 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 6. \quad 7 \\ + 6 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 7. \quad 23 \\ - 9 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 8. \quad 54 \\ - 8 \\ \hline 46 \end{array}$$

$$\begin{array}{r} 9. \quad 67 \\ + 7 \\ \hline 74 \end{array}$$

$$\begin{array}{r} 10. \quad 43 \\ + 8 \\ \hline 51 \end{array}$$

$$\begin{array}{r} 11. \quad 87 \\ - 54 \\ \hline 33 \end{array}$$

$$\begin{array}{r} 12. \quad 41 \\ + 58 \\ \hline 99 \end{array}$$

$$\begin{array}{r} 13. \quad 81 \\ - 42 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 14. \quad 34 \\ - 27 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 15. \quad 98 \\ + 87 \\ \hline 185 \end{array}$$

$$\begin{array}{r} 16. \quad 205 \\ + 75 \\ \hline 280 \end{array}$$

$$\begin{array}{r} 17. \quad 608 \\ - 76 \\ \hline 532 \end{array}$$

$$\begin{array}{r} 18. \quad 491 \\ + 27 \\ \hline 518 \end{array}$$

$$19. \quad 741 - 286$$

**455**

$$20. \quad 594 + 307$$

**901**

$$21. \quad 921 - 448$$

**473**

$$22. \quad 671 + 893$$

**1,564**

$$23. \quad 4,235 + 136$$

**4,371**

$$24. \quad 2,671 - 480$$

**2,191**

$$25. \quad 7,021 + 998$$

**8,019**

$$26. \quad 5,000 - 2,139$$

**2,861**

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

27. In one season, a football team scored 28, 34, 17, 24, 37, 45, and 26 points. How many points in all did the team score?

**211 points**

29. Tony read 3 books. One book had 327 pages. The others had 265 pages, and 235 pages. About how many pages did Tony read in all?

**About 800 pages**

31. The Nile River is 6,632 kilometers long. The Amazon River is 6,400 kilometers long. How much longer is the Nile River?

**232 km**

33. Martin Luther King, Jr. was born in 1929. He was awarded the Nobel Peace Prize 35 years later. In what year did he receive this prize?

**1964**

28. Hank Aaron hit 733 home runs in the National League and 22 more in the American League. He hit how many home runs in all?

**755 home runs**

30. A garden has 7 rows of corn with 8 plants in each row. How many corn plants are in the garden?

**56 plants**

32. A quarter has the same value as 5 nickels. Beth saved 65 quarters. How many nickels can she get for these quarters?

**325 nickels**

34. Clara Barton founded the American Red Cross and became its president in 1881. She remained its president until 1904. How many years was she president?

**23 yrs.**



# MAINTENANCE

Find each answer.

$$\begin{array}{r} 1. \quad 3 \\ \times 9 \\ \hline 27 \end{array}$$

$$\begin{array}{r} 2. \quad 15 \\ - 6 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 3. \quad 7 \\ + 7 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 4. \quad 0 \\ \times 9 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 5. \quad 6 \\ \times 6 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 6. \quad 13 \\ - 9 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 7. \quad 4 \\ + 7 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 8. \quad 7 \\ + 8 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 9. \quad 16 \\ - 8 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 10. \quad 9 \\ \times 9 \\ \hline 81 \end{array}$$

$$\begin{array}{r} 11. \quad 12 \\ - 7 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 12. \quad 5 \\ \times 8 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 13. \quad 6 \\ \times 7 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 14. \quad 9 \\ - 0 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 15. \quad 7 \\ \times 7 \\ \hline 49 \end{array}$$

$$\begin{array}{r} 16. \quad 9 \\ + 0 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 17. \quad 14 \\ - 8 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 18. \quad 5 \\ \times 9 \\ \hline 45 \end{array}$$

$$\begin{array}{r} 19. \quad 8 \\ \times 7 \\ \hline 56 \end{array}$$

$$\begin{array}{r} 20. \quad 9 \\ - 9 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 21. \quad 13 \\ - 8 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 22. \quad 8 \\ + 9 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 23. \quad 9 \\ + 7 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 24. \quad 18 \\ - 9 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 25. \quad 7 \\ + 6 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 26. \quad 7 \\ \times 1 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 27. \quad 8 \\ - 7 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 28. \quad 14 \\ - 8 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 29. \quad 8 \\ \times 5 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 30. \quad 13 \\ - 7 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 31. \quad 8 \\ \times 8 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 32. \quad 11 \\ - 6 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 33. \quad 5 \\ + 8 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 34. \quad 6 \\ + 6 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 35. \quad 9 \\ \times 6 \\ \hline 54 \end{array}$$

## Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

36. Mr. Johnson rides the train 21 miles to and from work each day. How far does he ride if he goes to work 250 days in one year?  
**5250 miles**

38. Betty rides the bus to school for 16 blocks and then walks the remaining 7 blocks. How many more blocks does she ride than walk?  
**9 blocks**

40. One day, George took a taxi to school. It cost \$3.00. He had \$1.95 in his bookbag and \$1.35 in his pocket. Did he have enough money?  
**Yes**

37. One year a news magazine sold 4,615,594 copies, a sports magazine sold 2,448,486 copies, and a childrens magazine sold 1,452,201 copies. Find the total number of copies sold.  
**8,516,281 copies**

39. Sharda rides her bicycle 3 miles each day going to school and back. How far does she ride her bicycle in 5 days?  
**15 miles**

41. Mrs. White put 13 gallons of gas in her car. The car can go 21 miles on each gallon of gas. About how many miles can she drive on this gas?  
**About 200 miles**

Use after Chapter 6. 403

## Maintenance

Use anytime after chapter 6. The skills required to do this Maintenance page have been taught prior to page 178.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. The calculator is an appropriate choice for Problem 37. Students should compute their answers to Problems 38 and 39 mentally. Only an estimate is required for Problems 40 and 41; however, in Problem 41 students should remember that a low estimate is appropriate.



## Maintenance

Use anytime after chapter 7. The skills required to do this Maintenance page have been taught prior to page 210.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. Students should compute their answers to Problem 33 mentally. The calculator is an appropriate choice for Problem 34.

For a discussion of when to choose mental math and when to choose a calculator, see pages 444-445 and pages 450-451 of this Teacher's Edition.

## MAINTENANCE

Find each answer.

$$\begin{array}{r} 1. \quad 17 \\ + 6 \\ \hline 23 \end{array}$$

$$\begin{array}{r} 2. \quad 69 \\ + 4 \\ \hline 73 \end{array}$$

$$\begin{array}{r} 3. \quad 135 \\ + 77 \\ \hline 212 \end{array}$$

$$\begin{array}{r} 4. \quad 25 \\ - 16 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 5. \quad 37 \\ - 28 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 6. \quad 618 \\ - 136 \\ \hline 482 \end{array}$$

$$\begin{array}{r} 7. \quad 291 \\ + 359 \\ \hline 650 \end{array}$$

$$\begin{array}{r} 8. \quad 7,986 \\ - 6,361 \\ \hline 1,625 \end{array}$$

$$\begin{array}{r} 9. \quad 728 \\ + 39 \\ \hline 767 \end{array}$$

$$\begin{array}{r} 10. \quad 376 \\ + 158 \\ \hline 534 \end{array}$$

$$11. \quad 953 - 85$$

**868**

$$12. \quad 5,148 + 263$$

**5,411**

$$13. \quad 800 - 175$$

**625**

$$14. \quad 7,737 + 1,642$$

**9,379**

$$15. \quad 647 - 392$$

**255**

$$16. \quad 6,982 + 3,845$$

**10,827**

$$17. \quad 600 - 283$$

**317**

$$18. \quad 2,337 + 2,493$$

**4,830**

$$\begin{array}{r} 19. \quad 29 \\ \times 4 \\ \hline 116 \end{array}$$

$$\begin{array}{r} 20. \quad 215 \\ \times 7 \\ \hline 1,505 \end{array}$$

$$\begin{array}{r} 21. \quad 348 \\ \times 9 \\ \hline 3,132 \end{array}$$

$$\begin{array}{r} 22. \quad 406 \\ \times 6 \\ \hline 2,436 \end{array}$$

$$\begin{array}{r} 23. \quad 22 \\ \times 5 \\ \hline 110 \end{array}$$

$$\begin{array}{r} 24. \quad 875 \\ \times 4 \\ \hline 3,500 \end{array}$$

$$\begin{array}{r} 25. \quad 195 \\ \times 9 \\ \hline 1,755 \end{array}$$

$$\begin{array}{r} 26. \quad 300 \\ \times 6 \\ \hline 1,800 \end{array}$$

$$\begin{array}{r} 27. \quad 1,049 \\ \times 7 \\ \hline 7,343 \end{array}$$

$$\begin{array}{r} 28. \quad 3,610 \\ \times 2 \\ \hline 7,220 \end{array}$$

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

29. Kim traveled 237 miles on Saturday, 374 miles on Sunday, 218 miles on Monday, 288 miles on Tuesday, and 347 miles on Wednesday. How many miles did she travel in all?

**1,464 miles**

31. Ed traveled 364 miles on his vacation last year. This year he traveled 492 miles farther than last year. How many miles did Ed travel on his vacation this year?

**128 more miles**

33. A swimming pool is 50 yards long. Ruth swam 3 lengths of the pool. How many yards did she swim?

**150 yards**

30. Mr. Taft offered to give the students at Mills School a ride in his airplane. He can take 18 students at one time. If he makes 23 trips, about how many students can he take for a ride in all?

**About 400 students**

32. To raise money for their school, a parent's club sold calendars for \$2.25 each. They sold 189 calendars. How much money did they raise?

**\$425.25**

34. Glenbrook has a population of 72,430 people. In the last election 39,537 people voted. How many people did not vote?

**32,893 people**



# MAINTENANCE

Give each answer. Watch the signs.

- |                               |                             |                               |                               |                             |                               |
|-------------------------------|-----------------------------|-------------------------------|-------------------------------|-----------------------------|-------------------------------|
| 1. $4 + 3$<br><b>7</b>        | 2. $5 - 3$<br><b>2</b>      | 3. $6 \times 4$<br><b>24</b>  | 4. $8 \times 2$<br><b>16</b>  | 5. $14 - 7$<br><b>7</b>     | 6. $7 - 1$<br><b>6</b>        |
| 7. $6 + 6$<br><b>12</b>       | 8. $14 - 9$<br><b>5</b>     | 9. $9 \times 8$<br><b>72</b>  | 10. $81 \div 9$<br><b>9</b>   | 11. $6 + 9$<br><b>15</b>    | 12. $13 - 8$<br><b>5</b>      |
| 13. $8 \times 4$<br><b>32</b> | 14. $2 + 7$<br><b>9</b>     | 15. $5 \times 7$<br><b>35</b> | 16. $10 - 7$<br><b>3</b>      | 17. $4 + 6$<br><b>10</b>    | 18. $6 \times 1$<br><b>6</b>  |
| 19. $2 + 4$<br><b>6</b>       | 20. $36 \div 9$<br><b>4</b> | 21. $6 \times 8$<br><b>48</b> | 22. $5 + 3$<br><b>8</b>       | 23. $12 - 3$<br><b>9</b>    | 24. $9 + 8$<br><b>17</b>      |
| 25. $3 \times 9$<br><b>27</b> | 26. $7 + 4$<br><b>11</b>    | 27. $11 - 3$<br><b>8</b>      | 28. $3 \times 7$<br><b>21</b> | 29. $2 + 8$<br><b>10</b>    | 30. $40 \div 5$<br><b>8</b>   |
| 31. $8 + 8$<br><b>16</b>      | 32. $9 - 3$<br><b>6</b>     | 33. $9 \times 7$<br><b>63</b> | 34. $10 - 5$<br><b>5</b>      | 35. $6 + 7$<br><b>13</b>    | 36. $18 - 9$<br><b>9</b>      |
| 37. $56 \div 8$<br><b>7</b>   | 38. $8 + 4$<br><b>12</b>    | 39. $3 \times 6$<br><b>18</b> | 40. $11 - 6$<br><b>5</b>      | 41. $3 + 3$<br><b>6</b>     | 42. $6 \times 9$<br><b>54</b> |
| 43. $0 \times 7$<br><b>0</b>  | 44. $9 - 8$<br><b>1</b>     | 45. $6 + 2$<br><b>8</b>       | 46. $15 - 7$<br><b>8</b>      | 47. $42 \div 6$<br><b>7</b> | 48. $6 \times 6$<br><b>36</b> |
| 49. $7 \times 4$<br><b>28</b> | 50. $9 + 4$<br><b>13</b>    | 51. $12 - 5$<br><b>7</b>      | 52. $0 + 7$<br><b>7</b>       | 53. $2 + 9$<br><b>11</b>    | 54. $18 \div 2$<br><b>9</b>   |
| 55. $3 \times 8$<br><b>24</b> | 56. $4 - 2$<br><b>2</b>     | 57. $7 \times 2$<br><b>14</b> | 58. $4 \times 3$<br><b>12</b> | 59. $7 - 2$<br><b>5</b>     | 60. $14 - 8$<br><b>6</b>      |

## Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

- |   |   |
|---|---|
| 61. A baby blue whale gains about 96 kilograms per day. About how many kilograms would the whale gain in one week?<br><b>About 700 kg</b>   | 62. A citrus orchard has room for 27 rows of orange trees. If Mr. Wayne plants about 39 trees in each row, will he have room for 850 trees?<br><b>Yes</b>                                     |
| 63. An African elephant weighed 7,025 kilograms. An Asian elephant weighed 4,890 kilograms. How much more did the African elephant weigh than the Asian elephant?<br><b>2,135 kg more</b> | 64. Mr. Fry traveled 963 miles from Boston to Chicago, 1,067 miles from Chicago to Houston and 1,804 miles from Houston to Boston. How many miles did he travel in all?<br><b>3,834 miles</b> |
| 65. The school bus left school carrying 52 students. At the first stop, 12 students got off. How many students were left on bus?<br><b>40 students</b>                                    | 66. A chicken egg takes 21 days to hatch. How many weeks is this? (7 days = 1 week)<br><b>3 weeks</b>   |

Use after Chapter 8. 405

## Maintenance

Use anytime after chapter 8. The skills required to do this Maintenance page have been taught prior to page 240.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. An estimate is sufficient for Problems 61 and 62. Students should compute mentally to find an answer for Problem 66. Encourage students to compute the answer to Problem 65 mentally.



## Maintenance

Use anytime after chapter 9. The skills required to do this Maintenance page have been taught prior to page 274.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. An estimate is sufficient for Problems 28 and 33. Encourage students to compute answers to Problems 29 and 32 mentally.

For a discussion of when to choose mental math and when to choose a calculator, see pages 444-445 and pages 450-451 of this Teacher's Edition.

## MAINTENANCE

Find each answer.

$$\begin{array}{r} 1. \quad 45 \\ + 56 \\ \hline 101 \end{array}$$

$$\begin{array}{r} 2. \quad 87 \\ - 49 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 3. \quad 31 \\ \times 5 \\ \hline 155 \end{array}$$

$$\begin{array}{r} 4. \quad 386 \\ + 457 \\ \hline 843 \end{array}$$

$$\begin{array}{r} 5. \quad 749 \\ - 386 \\ \hline 363 \end{array}$$

$$\begin{array}{r} 6. \quad 349 \\ \times 2 \\ \hline 698 \end{array}$$

$$\begin{array}{r} 7. \quad 923 \\ - 819 \\ \hline 104 \end{array}$$

$$\begin{array}{r} 8. \quad 486 \\ + 375 \\ \hline 861 \end{array}$$

$$\begin{array}{r} 9. \quad 9,562 \\ \times 3 \\ \hline 28,686 \end{array}$$

$$\begin{array}{r} 10. \quad 3,927 \\ + 1,516 \\ \hline 5,443 \end{array}$$

$$\begin{array}{r} 11. \quad 7,890 \\ - 1,682 \\ \hline 6,208 \end{array}$$

$$\begin{array}{r} 12. \quad 485 \\ + 49 \\ \hline 534 \end{array}$$

$$\begin{array}{r} 13. \quad 208 \\ \times 5 \\ \hline 1,040 \end{array}$$

$$\begin{array}{r} 14. \quad 9,005 \\ - 1,287 \\ \hline 7,718 \end{array}$$

$$\begin{array}{r} 15. \quad 3,219 \\ + 486 \\ \hline 3,705 \end{array}$$

$$16. \quad 7 \times 6,003$$

$$42,021$$

$$17. \quad 4,860 + 853$$

$$5,713$$

$$18. \quad 2,850 - 634$$

$$2,216$$

$$19. \quad 5 \times 1,020$$

$$5,100$$

$$20. \quad 800 - 57$$

$$743$$

$$21. \quad 98 + 526$$

$$624$$

$$22. \quad 32 \times 593$$

$$18,976$$

$$23. \quad 8,068 - 989$$

$$7,079$$

$$24. \quad 38 \times 73$$

$$2,774$$

$$25. \quad 675 + 36$$

$$711$$

$$26. \quad 8,309 - 657$$

$$7,652$$

$$27. \quad 231 \times 6$$

$$1,386$$

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

28. A student ticket to a play is \$1.75. Would \$50.00 be enough to buy tickets for 38 students?

**No**

30. Don had \$10.00. He spent \$0.79 for a pen, \$1.45 for lunch, and \$2.89 for a book. How much money did he have left?

**\$4.87**

32. There were 49 students on Bus A and 54 students on Bus B. How many more students were on Bus B than on Bus A?

**5 more students**

34. Connie has 436 coins in her collection. Of these, 152 are American coins. The rest are foreign coins. How many are foreign coins?

**284 foreign coins**

29. At noon the temperature was 57°. By evening it had dropped 12°. What was the evening temperature?

**45°**

31. Anita has 3 shelves with 17 books on each. How many books are on the shelves?

**51 books**

33. The Corrins drove 385 miles in the morning and 147 miles later. Their car will go 500 miles on a tank of gas. Did they need to stop for gas?

**Yes**

35. Jose practiced piano 35 minutes on Monday, 55 minutes on Tuesday, and 75 minutes on Wednesday. Find the average number of minutes he practiced per day.

**55 minutes per day**



# MAINTENANCE

Find each answer.

$$\begin{array}{r} 1. \quad 47 \\ + 51 \\ \hline 98 \end{array}$$

$$\begin{array}{r} 2. \quad 68 \\ + 95 \\ \hline 163 \end{array}$$

$$\begin{array}{r} 3. \quad 307 \\ + 89 \\ \hline 396 \end{array}$$

$$\begin{array}{r} 4. \quad 277 \\ + 384 \\ \hline 661 \end{array}$$

$$\begin{array}{r} 5. \quad 4,063 \\ + 512 \\ \hline 4,575 \end{array}$$

$$\begin{array}{r} 6. \quad 57 \\ - 32 \\ \hline 25 \end{array}$$

$$\begin{array}{r} 7. \quad 603 \\ - 158 \\ \hline 445 \end{array}$$

$$\begin{array}{r} 8. \quad 917 \\ - 635 \\ \hline 282 \end{array}$$

$$\begin{array}{r} 9. \quad 2,482 \\ - 937 \\ \hline 1,545 \end{array}$$

$$\begin{array}{r} 10. \quad 7,001 \\ - 2,589 \\ \hline 4,412 \end{array}$$

$$\begin{array}{r} 11. \quad 84 \\ \times 2 \\ \hline 168 \\ 24 \end{array}$$

$$\begin{array}{r} 12. \quad 703 \\ \times 6 \\ \hline 4,218 \\ 308 \text{ R1} \end{array}$$

$$\begin{array}{r} 13. \quad 8,045 \\ \times 4 \\ \hline 32,180 \\ 3 \text{ R54} \end{array}$$

$$\begin{array}{r} 14. \quad 215 \\ \times 74 \\ \hline 15,910 \\ 5 \text{ R4} \end{array}$$

$$\begin{array}{r} 15. \quad 389 \\ \times 32 \\ \hline 12,448 \\ 12 \text{ R13} \end{array}$$

$$16. \quad 4 \overline{)96}$$

$$17. \quad 3 \overline{)925}$$

$$18. \quad 70 \overline{)264}$$

$$19. \quad 29 \overline{)149}$$

$$20. \quad 42 \overline{)517}$$

$$21. \quad 38 + 9$$

$$47$$

$$22. \quad 74 + 26$$

$$100$$

$$23. \quad 385 + 76$$

$$461$$

$$24. \quad 8,205 + 156$$

$$8,361$$

$$25. \quad 91 - 50$$

$$41$$

$$26. \quad 433 - 78$$

$$355$$

$$27. \quad 200 - 138$$

$$62$$

$$28. \quad 6,002 - 473$$

$$5,529$$

$$29. \quad 26 \times 8$$

$$208$$

$$30. \quad 340 \times 3$$

$$1,020$$

$$31. \quad 1,204 \times 7$$

$$8,428$$

$$32. \quad 105 \times 25$$

$$2,625$$

$$33. \quad 53 \div 4$$

$$13 \text{ R1}$$

$$34. \quad 613 \div 2$$

$$306 \text{ R1}$$

$$35. \quad 75 \div 21$$

$$3 \text{ R12}$$

$$36. \quad 482 \div 64$$

$$7 \text{ R34}$$

## Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

37. A gallon of paint costs \$14.95. Is \$150 enough money to buy 9 gallons of paint?

**Yes**

39. An airplane flew 1,200 miles in 3 hours. What was the average speed in miles per hour?

**400 mph**

41. The 83 fourth graders sold 996 tickets to the school fair. What was the average number of tickets sold per student?

**12 tickets**

38. There are 43 passengers on each of 5 buses. About how many passengers are there in all?

**About 200 passengers**

40. A human body has 68 bones in the hands and face. There are 138 bones in the rest of the body. What is the total number of bones?

**206 bones**

42. A bakery bakes an average of 1,875 loaves of bread each day. How many days will it take to bake 15,000 loaves of bread?

**8 days**

## Maintenance

Use anytime after chapter 10. The skills required to do this Maintenance page have been taught prior to page 300.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method.

An estimate is sufficient for Problems 37 and 38. Students should compute the answer to Problem 39 mentally. The calculator is an appropriate choice for Problem 42.



## Maintenance

Use anytime after chapter 11. The skills required to do this Maintenance page have been taught prior to page 330.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. For Problems 33 and 37, an estimate is sufficient. Students should choose to compute mentally in Problem 38. Encourage students to compute mentally in Problems 35 and 36.

For a discussion of when to choose mental math and when to choose a calculator, see pages 444-445 and pages 450-451 of this Teacher's Edition.

## MAINTENANCE

Tell what the 7 means in each number.

- |                                  |                                |                              |                                  |
|----------------------------------|--------------------------------|------------------------------|----------------------------------|
| 1. 71<br><b>7 tens</b>           | 2. 17<br><b>7 ones</b>         | 3. 724<br><b>7 hundreds</b>  | 4. 372<br><b>7 tens</b>          |
| 5. 6,762<br><b>7 hundreds</b>    | 6. 7,330<br><b>7 thousands</b> | 7. 3,072<br><b>7 tens</b>    | 8. 7,043<br><b>7 thousands</b>   |
| 9. 6.7<br><b>7 tenths</b>        | 10. 7.3<br><b>7 ones</b>       | 11. 17.4<br><b>7 ones</b>    | 12. 29.7<br><b>7 tenths</b>      |
| 13. 50.67<br><b>7 hundredths</b> | 14. 19.75<br><b>7 tenths</b>   | 15. 10.79<br><b>7 tenths</b> | 16. 58.07<br><b>7 hundredths</b> |

Add or subtract.

- |                                   |                                  |                                  |                                    |
|-----------------------------------|----------------------------------|----------------------------------|------------------------------------|
| 17. $9.08 + 3.96$<br><b>13.04</b> | 18. $4.87 + 1.18$<br><b>6.05</b> | 19. $267 - 88$<br><b>179</b>     | 20. $345 - 189$<br><b>156</b>      |
| 21. $5.78 - 3.87$<br><b>1.91</b>  | 22. $4.56 - 2.89$<br><b>1.67</b> | 23. $519 + 283$<br><b>802</b>    | 24. $437 + 274$<br><b>711</b>      |
| 25. $4.2 + 3.9$<br><b>8.1</b>     | 26. $2.7 + 4.6$<br><b>7.3</b>    | 27. $865 - 568$<br><b>297</b>    | 28. $642 - 246$<br><b>396</b>      |
| 29. $156 + 287$<br><b>443</b>     | 30. $265 + 378$<br><b>643</b>    | 31. $5.42 - 2.45$<br><b>2.97</b> | 32. $83.21 - 1.23$<br><b>81.98</b> |

### Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

- |  |   |
|--|---|
| 33. Tim has \$8.67. Lisa has \$5.83 more than Tim. Does Lisa have enough to buy a sweatshirt for \$15.00?<br><b>No</b>                       | 34. Ben has \$26.37. Joe has \$9.89 less than Ben. Ty has \$7.59 less than Joe. How much money does Ty have?<br><b>\$8.89</b>                                 |
| 35. Cory skated 20 minutes each day for 12 days. How many minutes did he skate in all?<br><b>240 min.</b>                                    | 36. Machiko made 25 packets from 600 sheets of paper. How many sheets were in each packet?<br><b>24 sheets</b>  |
| 37. The Reading Club bought 34 books. Each book costs \$1.76. About how much did they pay for all the books?<br><b>About \$60.00</b>         | 38. Ms. Green divided 56 sheets of paper equally among 8 people. How many sheets did each person get?<br><b>7 sheets</b>                                      |
| 39. The Burke family drove 689 miles on Friday and 1,045 miles on Saturday. How much farther did they drive on Saturday?<br><b>356 miles</b> | 40. During one month a veterinarian treated 19 birds, 36 cats, 29 dogs, and 17 other animals. How many animals did he treat that month?<br><b>101 animals</b> |



# MAINTENANCE

Add or subtract.

$$\begin{array}{r} 1. \quad \frac{5}{7} \\ + \frac{1}{7} \\ \hline \frac{6}{7} \end{array}$$

$$\begin{array}{r} 2. \quad \frac{4}{7} \\ - \frac{3}{7} \\ \hline \frac{1}{7} \end{array}$$

$$\begin{array}{r} 3. \quad \frac{4}{5} \\ - \frac{1}{5} \\ \hline \frac{3}{5} \end{array}$$

$$\begin{array}{r} 4. \quad \frac{4}{6} \\ + \frac{1}{6} \\ \hline \frac{5}{6} \end{array}$$

$$\begin{array}{r} 5. \quad \frac{8}{10} \\ - \frac{5}{10} \\ \hline \frac{3}{10} \end{array}$$

$$\begin{array}{r} 6. \quad \frac{2}{8} \\ + \frac{2}{8} \\ \hline \frac{4}{8} \end{array}$$

$$\begin{array}{r} 7. \quad \frac{5}{6} \\ - \frac{4}{6} \\ \hline \frac{1}{6} \end{array}$$

$$\begin{array}{r} 8. \quad \frac{7}{8} - \frac{1}{8} \\ \hline \frac{6}{8} \end{array}$$

$$\begin{array}{r} 9. \quad \frac{2}{3} + \frac{1}{3} \\ \hline \frac{3}{3} \end{array}$$

$$\begin{array}{r} 10. \quad \frac{3}{7} + \frac{2}{7} \\ \hline \frac{5}{7} \end{array}$$

$$\begin{array}{r} 11. \quad \frac{0}{3} + \frac{1}{3} \\ \hline \frac{1}{3} \end{array}$$

$$\begin{array}{r} 12. \quad \frac{11}{12} - \frac{3}{12} \\ \hline \frac{8}{12} \end{array}$$

$$\begin{array}{r} 13. \quad \frac{2}{4} + \frac{2}{4} \\ \hline \frac{4}{4} \end{array}$$

$$\begin{array}{r} 14. \quad 9.6 \\ + 4.3 \\ \hline 13.9 \end{array}$$

$$\begin{array}{r} 15. \quad 2.6 \\ + 5.2 \\ \hline 7.8 \end{array}$$

$$\begin{array}{r} 16. \quad 7.8 \\ - 6.5 \\ \hline 1.3 \end{array}$$

$$\begin{array}{r} 17. \quad 35.63 \\ - 19.72 \\ \hline 15.91 \end{array}$$

$$\begin{array}{r} 18. \quad 48.64 \\ - 11.09 \\ \hline 37.55 \end{array}$$

$$\begin{array}{r} 19. \quad 47.96 \\ + 21.38 \\ \hline 69.34 \end{array}$$

$$\begin{array}{r} 20. \quad 36.8 \\ + 9.7 \\ \hline 46.5 \end{array}$$

$$\begin{array}{r} 21. \quad 57.3 \\ - 8.5 \\ \hline 48.8 \end{array}$$

$$\begin{array}{r} 22. \quad 24.05 \\ - 16.56 \\ \hline 7.49 \end{array}$$

$$\begin{array}{r} 23. \quad 3.04 \\ + 7.99 \\ \hline 11.03 \end{array}$$

$$\begin{array}{r} 24. \quad 32.47 - 20.81 \\ \hline 11.66 \end{array}$$

$$\begin{array}{r} 25. \quad 8.6 - 4.5 \\ \hline 4.1 \end{array}$$

$$\begin{array}{r} 26. \quad 14.08 + 25.62 \\ \hline 39.7 \end{array}$$

$$\begin{array}{r} 27. \quad 6 - 4.02 \\ \hline 1.98 \end{array}$$

$$\begin{array}{r} 28. \quad 8.4 + 6.2 \\ \hline 14.6 \end{array}$$

$$\begin{array}{r} 29. \quad 15 + 8.07 \\ \hline 23.07 \end{array}$$

$$\begin{array}{r} 30. \quad 8.07 - 4.32 \\ \hline 3.75 \end{array}$$

$$\begin{array}{r} 31. \quad 90 - 40.38 \\ \hline 49.62 \end{array}$$

## Choosing a Computation Method

Calculator, Paper and Pencil, Mental Math, Estimation

Use the best method to solve each problem. Tell which method you used.

32. David weighs 44.6 kilograms. Sue weighs 25.9 kilograms. How much heavier is David than Sue?

**18.7 kg**

34. Jack scored 9,476 points on a computer game. Tim scored 16,785 points. Ken scored 22,359 points. How many points did they score in all?

**48,620 points**

36. Mandy spent  $2\frac{1}{2}$  days reading a mystery book. She then spent  $6\frac{1}{2}$  days reading a biography. How much longer did Mandy spend reading the biography?

**4 days**

33. Fred's bike cost \$98.95. Elena's bike cost \$79.87. What is the total cost of the two bikes?

**\$178.82**

35. Alex and Anthony worked on a science project together. Alex spent \$4.69 and Anthony spent \$5.78. Did they spend more or less than \$10.00?

**More than \$10.00**

37. Loretta used  $\frac{1}{3}$  cup of water and  $\frac{2}{3}$  cup of milk in a recipe for bread. How much liquid did she use in all?

**$\frac{1}{3} + \frac{2}{3}$  cup or 1 cup**

## Maintenance

Use anytime after chapter 12. The skills required to do this Maintenance page have been taught prior to page 348.

**Choosing a computation method** For each problem, ask students to explain their choice of a computation method. The calculator is an appropriate choice for Problem 34. An estimate is sufficient for Problem 35. Encourage students to compute their answers to Problems 36 and 37 mentally.



## Using Problem-Solving Strategies

- List all possibilities.

### Introduction

This lesson guides the student in making a list in a systematic way.

### Using the Page

To make sure the students understand the problem, ask, "What kinds of crust can you order? [Thick or thin] How many pizza sizes are there?" [3] Have students make a table like the one shown. Have students record any choice on line 1 in the table.

To answer Problem 1, the students choose the same size as they chose for line 1 in the table, but they list a different crust. An example of this choice is recorded on line 2 of the table.

Example:

| Size     | Crust |
|----------|-------|
| 1. large | thick |
| 2. large | thin  |

Students continue to *list all possibilities* by choosing a different size pizza and repeating the crust choices in the same order. They complete the table by listing a third, different size, pizza and repeating the crust choices in the same order.

There are several systematic ways to list the pizza choices for Problem 2. One possible method would be to have students first list one size and one crust with each of the 3 toppings.

| Size     | Crust | Topping      |
|----------|-------|--------------|
| 1. large | thick | mushroom     |
| 2. large | thick | onion        |
| 3. large | thick | green pepper |

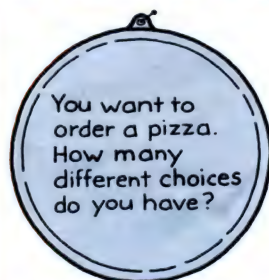
Next, list the same size (large) and a different crust (thin) with each of the 3 toppings. On the next 6 lines, repeat the process with a different size (medium)—then 6 more lines with the third size pizza. [18 choices are possible.]

### Follow-Up

Suggest to students that with their pizza they can order a tossed salad, raw vegetable platter, and soup. How many meals are possible from this menu? [54 meals]

## Using Problem-Solving Strategies

# PICK A PIZZA



| Size                 | Crust |
|----------------------|-------|
| (Answers will vary.) |       |
| 1. large             | thick |
| 2. large             | thin  |
| 3. medium            | thick |
| 4. medium            | thin  |
| 5. small             | thick |
| 6. small             | thin  |

1. How many combinations of size and crust are there? Make a table like the one shown. Complete the table to show all the possibilities. **6 combinations**

2. If you could choose from toppings of mushroom, onion, or green pepper, how many choices would you have? (Make a list on another piece of paper.) **18 choices**  
**See margin.**



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

### Answers (Order of answers may vary.)

| 2. Size | Crust | Topping      |
|---------|-------|--------------|
| large   | thick | mushroom     |
| large   | thick | onion        |
| large   | thick | green pepper |
| large   | thin  | mushroom     |
| large   | thin  | onion        |
| large   | thin  | green pepper |
| medium  | thick | mushroom     |
| medium  | thick | onion        |
| medium  | thick | green pepper |
| medium  | thin  | mushroom     |
| medium  | thin  | onion        |
| medium  | thin  | green pepper |
| small   | thick | mushroom     |
| small   | thick | onion        |
| small   | thick | green pepper |
| small   | thin  | mushroom     |
| small   | thin  | onion        |
| small   | thin  | green pepper |



## PLAY THE BUTTON GAME

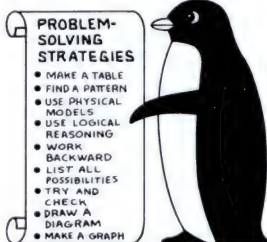
Play this game with a friend.

Place 15 buttons on a table and decide who goes first. Take turns picking up either 1 or 2 buttons. You are not allowed to skip your turn. You lose if you pick up the last button.



1. If there's 1 button left on the table and it's your turn, who wins?  
**The other player**
2. If it's your turn and there are 2 buttons left, how many buttons should you pick up?  
**One, in order to win**
3. If there are 4 buttons left, how many buttons should you pick up?  
**Doesn't matter. You lose.**
4. Describe a winning strategy for this game.  
**See margin.**
5. How does your strategy change if the winner is the player who picks up the last button? **See margin.**

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.



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### Answers

4. The first player (A) should take 2 buttons on the first turn to be the winner. Thereafter, if the second player (B) takes 1 button then A should take 2; if B takes 2, then A should take 1. This continues until A leaves 4 buttons and is assured of winning.
5. Instead of leaving 1, 4, 7, 10, or 13 buttons, you should leave 3, 6, 9, or 12 buttons after your turn.

## Using Problem-Solving Strategies

- Use physical models.
- Try and check.
- Find a pattern.

### Materials

- 15 buttons, beans, or bottle caps for each pair of students

### Introduction

This is a game for 2 players. The players take turns picking up either one or two buttons from a group of 15. The winner is the player who does *not* pick up the last button. Students try to find a pattern which would lead to a winning strategy.

### Using the Page

The question in Problem 1 ensures that the students understand how the winner of the game is determined. If there is one coin left and it's your turn, you must pick it up. You lose the game since the person picking up the last button loses.

Problem 2 helps students find a winning strategy. If it's your turn, and there are 2 buttons left, you should pick up only 1 button. This leaves 1 button on the table. The other player must pick up the last button, and therefore loses.

Have students *use the physical model*, the buttons, to solve Problem 3. They should *try and check* what occurs when they pick up 1 button out of 4. The other player should pick up 2 buttons leaving 1 button on the table. The first player loses. If the first player picks up 2 of the 4 buttons, the other player should pick up 1 button and again the first player is left with 1 button and he loses. Thus, if there are 4 buttons left and it's your turn, you lose.

To solve Problem 4, have students play the game a number of times. Encourage them to note the number of buttons left on the table when they know they have won (or lost) the game. Students should *find the pattern* that leaving 1, 4, 7, 10, or 13 buttons on the table can ensure a win. A player who knows this strategy and takes the first turn should always win the game.

Problem 5 presents a variation of the Button Game. In this new game the winner is the player who picks up the last button. A winning strategy is to leave 3, 6, 9, or 12 buttons after your turn. The player knowing this strategy and taking the second turn has the advantage in this variation of the game.



## Using Problem-Solving Strategies

- List all possibilities.

### Introduction

In the solution of this problem, students will make a list of possibilities and use the clues to gradually eliminate all the possibilities but one. The solution will require knowledge of place value, basic addition and subtraction facts, and some common sense about dates.

### Using the Page

The student page suggests numbering the months from 1 to 12. To answer Problem 1, have the students *list all possibilities* and examine those numbers. Since only one of those numbers has a 0 in the ones place, the month must be the tenth month, October.

The next clue tells us that the day of the birthday has 2 digits and that their difference is 7. The day, then, must be either 18 or 29. One clue tells us that one of the digits of his birthday is the same as the hundreds digit of the year he was born. Since we would expect the year to be sometime in the 1900s, the 29th is the obvious day.

The next clue tells us that the sum of the first 2 digits of the year is the same as the sum of the last 2 digits. It follows, then, that the year must be one of the following:

|      |      |       |
|------|------|-------|
| 1919 | 1946 | 1973  |
| 1928 | 1955 | 1982  |
| 1937 | 1964 | 1991. |

The ones digit is less than the tens digit, so we are left with these:

|      |      |      |       |
|------|------|------|-------|
| 1964 | 1973 | 1982 | 1991. |
|------|------|------|-------|

There are two years that have all odd digits, 1973 and 1991. To be alive now, the birthday would have to be October 29, 1973.

The answer to Problem 4 will vary depending on today's date.

### Follow-Up

Have students make up clues to their own birthdays, and let others try to guess when they were born.

Have them make up clues for important dates in history.

## Using Problem-Solving Strategies

# BIRTHDAY CLUES

On a piece of paper, number the months in order from 1 to 12, beginning with January. Now use the clues to answer the questions.

Clue: I am alive now and was born in a month whose number has 0 in the ones place.

1. In what month was I born?

**October - 10th month**

Clue: The date of my birthday has 2 digits. The difference of those digits is 7. One of those digits is also the hundreds digit of the year I was born.

2. On what day of the month was I born? **29th**

Clue: If you add the thousands digit of the year of my birth to the hundreds digit, the sum is the same as when you add the tens digit to the ones digit. The ones digit of that year is less than the tens digit.

Clue: All the digits in the year of my birth are odd.

3. When was I born? **October 29, 1973**

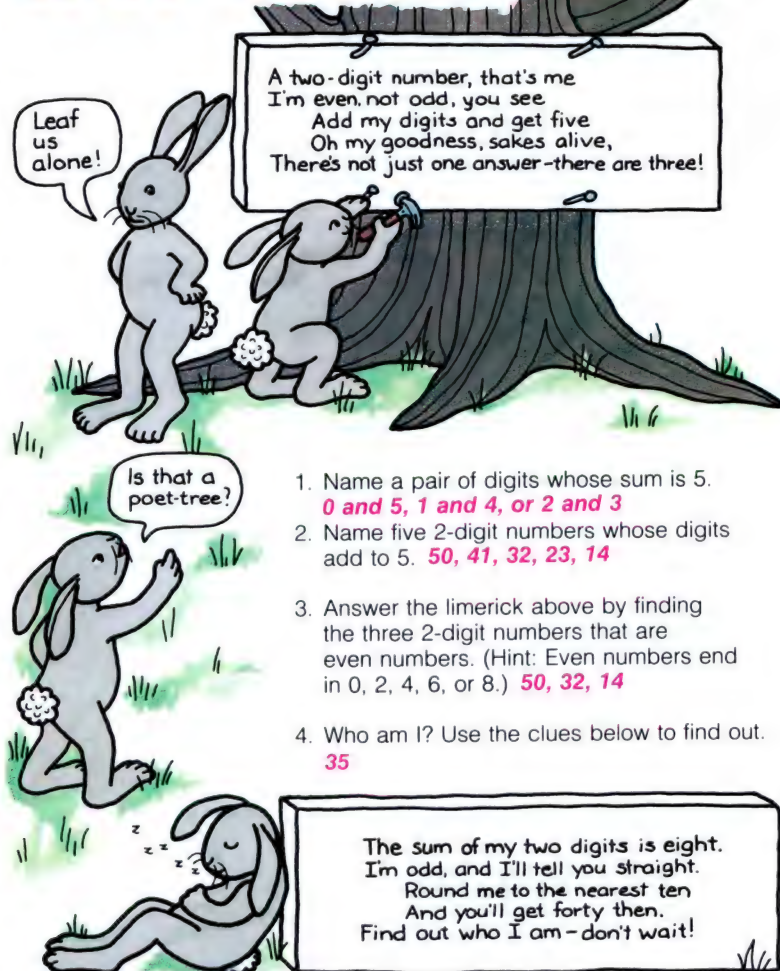
4. How old am I?

**Depends on today's date**





## WHO AM I?



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

## Using Problem-Solving Strategies

- List all possibilities.

### Introduction

Students will need to understand the term *digit* and the concepts of place value and of even and odd numbers. Problem 4 requires rounding to the nearest ten.

### Using the Page

Question the students about the limerick. Ask, "Name a 2-digit number." [Students can name any number from 10, 11, . . . 99.]

Tell the students that any number that ends in the digit 0, 2, 4, 6, or 8 is called an even number. If a number ends in the digit 1, 3, 5, 7, or 9, it is called an odd number. Then you could ask these questions. "Name a 2-digit even number. [10, 12, 14, . . . 98] Name a 2-digit number the sum of whose digits is 6. [15, 24, 33, 42, 51, or 60] Name a 2-digit even number the sum of whose digits is 6." [24, 42, or 60]

For Problems 1 and 2, have students list all possibilities of digit pairs whose sum is 5.

| tens digit | ones digit | number |
|------------|------------|--------|
| 1          | 4          | 14     |
| 2          | 3          | 23     |
| 3          | 2          | 32     |
| 4          | 1          | 41     |
| 5          | 0          | 50     |

For Problem 3, remove all odd numbers. [23 and 41] The answer to Problem 3 is the remaining even numbers. [14, 32, 50]

For Problem 4, students should list all 2-digit numbers the sum of whose digits is 8. [17, 26, 35, 44, 53, 62, 71, 80]. Then have them eliminate all the even numbers [26, 44, 62, 80] and round to the nearest ten each remaining odd number. [17, 20; 35, 40; 53, 50; 71, 70] 35 is the answer because it is the only number that rounds to 40.

### Follow-Up

Have students make up number riddles such as:

I'm a 2-digit, odd number. The sum of my digits is six and I'm greater than 50. Who am I? [51]

My ones and hundreds digits

Are exactly the same.

My tens digit is seven less.

I'm even. What's my name? [818]



## Using Problem-Solving Strategies

- Solve a simpler problem.
- Find a pattern.

### Introduction

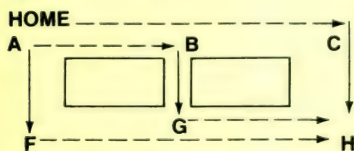
Students will *solve a simpler problem* and then progressively more difficult ones in order to solve this puzzle.

### Using the Page

Make sure the students understand that the letters on the diagram are used to mark the intersection of streets. Ask, "How many direct paths are there from home to **B**? [1] To **C**? [1] Use letters to describe the two paths from home to **G**." [**A—B—G** and **A—F—G**]

Explain that one of the best ways to solve this problem is to *solve a simpler problem*. Start by looking at paths to intersections close to home. Then consider those farther away. Remind students to use direct paths.

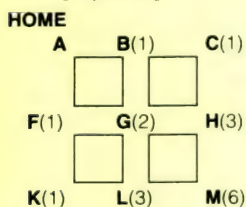
For Problem 1, have students look at the different paths Pam can walk to intersection H.



[Answer: 3 paths]

For Problem 2, the diagram showing paths to **L** is similar. [3 paths]

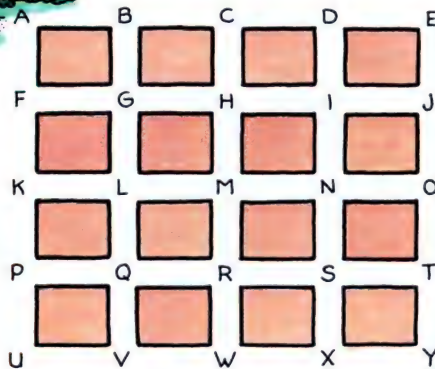
For Problem 3, have students copy the map on a piece of paper. Then direct them to write the number of paths from home next to each intersection letter. Then help them to *find a pattern*. They should notice that the number of paths to a given intersection is equal to the sum of the paths to the intersections directly above and immediately to the left of the given intersection. [6 paths]



## Using Problem-Solving Strategies

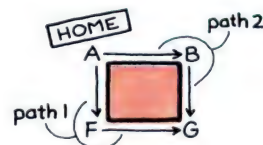
# PAM'S PATH PUZZLE

Pam drew a map to help her find the different paths she could take from her house to school. How many different paths could she take?



There are two different paths Pam can walk from her home to the intersection at **G**.

Pam walks directly to an intersection. She would not backtrack or walk to intersections **A**, **B**, **C**, **H**, and **G** to reach intersection **G**.



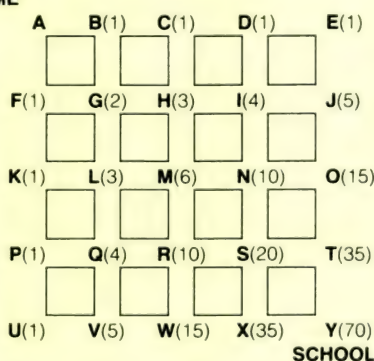
1. How many different paths can she take to **H**? **3 paths**
2. How many different paths can she take to **L**? **3 paths**
3. How many paths are there to intersection **M**? **6 paths**
4. How many paths are there to school? **70 paths**

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### Problem 4:

HOME





• Try and check.

## Introduction

Using the map provided, students determine the length of various routes. Students will need to compare and add three or more numbers having 2 or 3 digits each.

## Using the Page

Ask the students, "How many miles is it from Los Angeles to San Bernardino?" [65] How many miles from San Bernardino to Barstow? [73] If you drove from Los Angeles to Barstow, by way of San Bernardino, how many miles would you drive?" [138]

For Problem 1, the students add.

|                           |           |
|---------------------------|-----------|
| Los Angeles to Mojave     | 94 miles  |
| Mojave to Lone Pine       | 115 miles |
| Lone Pine to Death Valley | 106 miles |
| Total                     | 315 miles |

The answer to Problem 2 is that the route in Problem 1 is more miles than the route driven by the Carr family. Thus, to find the Carrs' route students must find a route that is shorter than the one through Mojave and Lone Pine.

For Problem 3, students use *try and check*. Since the trip through Mojave and Lone Pine is too long, the students must look at the map again. They should write down alternate routes and compute their lengths until one is found that equals 289 miles. [L.A. to Long Beach to San Bernardino to Barstow to Death Valley:  $21 + 67 + 73 + 128 = 289$ ]

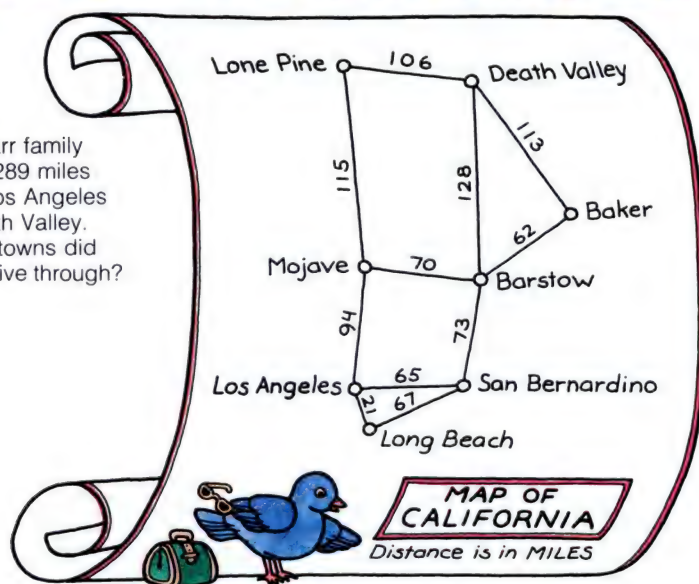
Problem 4 uses the same procedure as above. [Death Valley to Baker to Barstow to Mojave to L.A.:  $113 + 62 + 70 + 94 = 339$ ]

## Follow-Up

Have students solve similar problems using maps of your town or state. The local Chamber of Commerce, real estate offices, or the Automobile Association are good sources for maps.

## THE CARRS GO DRIVING

The Carr family drove 289 miles from Los Angeles to Death Valley. Which towns did they drive through?



- How many miles is it from Los Angeles to Death Valley if you drive through Mojave and Lone Pine? **315**
- Is this more or less than the number of miles driven by the Carr family? **More**
- Which towns did the Carr family drive through on the 289 mile trip from Los Angeles to Death Valley?  
**Long Beach, San Bernardino, and Barstow**
- On the return trip, the Carr family drove 339 miles. Through which towns did they drive? **Baker, Barstow, and Mojave**



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## Using Problem-Solving Strategies

- Draw a diagram.

### Introduction

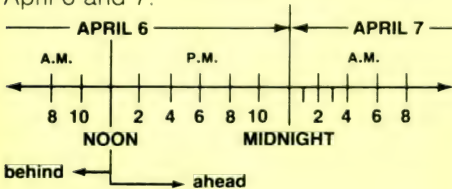
Students need to understand the concept of time, the meanings of midnight and noon, and the terms *A.M.* and *P.M.* They must also understand how to read digital clocks.

### Using the Page

Begin by asking the students what time it is in Chicago. [12 noon] "What is the day of the week? [Monday] What is the date?" [April 6]

"Is the time in San Francisco ahead of or behind the time in Chicago? [Behind] By how much? [2 hours] What is the date in San Francisco?" [April 6] Introduce this material slowly since the concept of times being different in different locations might be confusing to the students. Using a globe to quickly demonstrate time zones might be helpful.

Have students *make a diagram* of a time line which includes the times on April 6 and 7.



Students should then locate and label each city's time. They can then draw the 5 clocks and fill in the correct day, time, and date to answer Problem 1.

Before students attempt Problem 2, discuss whether the midnight between April 6th and 7th is the end of April 6th or the start of April 7th. Most authorities consider midnight to be the start of the next day. To solve Problem 2, students will need to extend their time lines to the right and find the time in each city 12 hours later. Students will find the time in Chicago to be midnight, and from the discussion should know to consider that as the next day, April 7th, and thus not part of their answer.



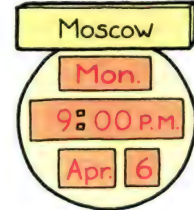
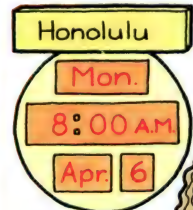
Problem 3 can be solved by following a similar procedure. [London and Moscow]

## Using Problem-Solving Strategies

# TIME FOR THE NEWS

If it is 12:00 noon, Monday, April 6, in Chicago, what time and date will each clock show if:

San Francisco is 2 hours behind,  
London is 6 hours ahead,  
Tokyo is 15 hours ahead,  
Honolulu is 4 hours behind,  
Moscow is 9 hours ahead.



It's 12 noon,  
Monday, April 6<sup>th</sup>  
And now the  
world news...



WORLD NEWS DESK

1. Draw 5 clocks like the ones shown here. Fill in each clock with the correct day, time, and date.
2. After 12 hours have passed, which clocks will still show the SAME day and date? **Chicago, San Francisco, Tokyo, Honolulu**
3. After 8 hours have passed, which clocks will show a different date? **London, Moscow**

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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

### Follow-Up

Students can use an almanac to find times for other cities and then make up similar problems.

Students can also work backward to find a given time. They can be given the time in Moscow and asked to find the time in London.



## HAPPY BIRTHDAY

A group of students in Michael's class were talking about birthdays.

They discovered that Michael's birthday is exactly 2 weeks before Andy's.

Andy's birthday is 2 days after Sandra's.

Sandra has her birthday on the same day of the month as Jimmy, but her birthday is 3 months earlier than his.

Darla's birthday is 3 days after Jimmy's and 6 days after Betty's.

Betty's birthday is on the 4th of July.

1. When is Darla's birthday? **July 10**
2. When is Jimmy's birthday? **July 7**
3. When is Michael's birthday? **March 26**



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

## Using Problem-Solving Strategies

- Work backward.

### Materials

- Calendars

### Introduction

This problem will be solved by starting with Betty's birthday and using the given information to discover each of the other students' birthdays. Although knowledge of the number of days in each month is needed to find a solution, students should be able to look at a calendar to get this information.

### Using the Page

Have the students read the problem and discuss it. Do any of your students have birthdays on July 4th? Do any students have the same birthday? Do any have birthdays exactly 2 weeks apart?

Problem 1 gets students started toward a solution. On a calendar, circle July 4th, Betty's birthday. Since Darla's birthday is 6 days after that, we can count days on the calendar to find her birthday. [July 10] Mark and label that day.

Continue *working backward* to find all the other birthdays. Darla's birthday is 3 days after Jimmy's. Count back 3 days. Mark and label Jimmy's birthday. [July 7]

For Problem 3, turn the calendar back 3 months to find Sandra's birthday. [April 7] Count 2 days after that to find Andy's birthday. [April 9] Then go back 2 weeks to find Michael's birthday. [March 26]

### Follow-Up

Look at calendars from other years. Point out to your students that the calendar changes from year to year. See if the solution to the problem is different if a calendar from another year is used.

Have students make up a similar list of statements from information about their own birthdays.



## Using Problem-Solving Strategies

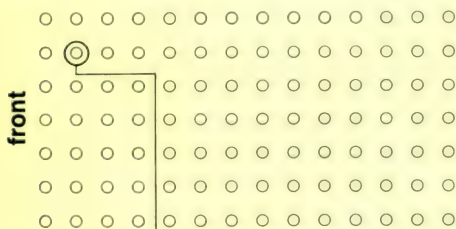
- Draw a diagram.

### Introduction

In this solution, an array is used to picture the band in rows and columns. Although students may count to find answers to the questions, multiplication should be encouraged.

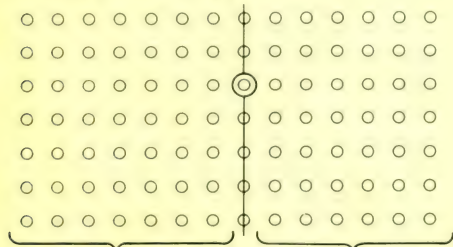
### Using the Page

Begin by having students read the problem. Discuss the problem and draw a diagram to help them understand the numbers on the hats.



Person 2,6 (second row, sixth in the row)

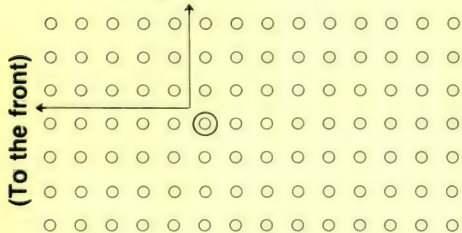
To answer Problems 1 and 2, students should locate player 8,5 in the array. Then have them draw a line through that player's row. Have them think about what multiplication facts can be used to answer the problems.



7 × 7 ahead of him 6 × 7 behind him

A similar technique can be used to answer Problems 3 and 4. To answer Problem 5 requires a careful examination of the diagram. [15 players]

(To the right)



## Using Problem-Solving Strategies

# THE ORDERLY BAND

While watching a parade, Joe noticed that all the members of one band had 2 numbers on their hats. He noticed that the first number told what row that person was in, and the second number told how far to the left the person was.

The band member wearing hat number 2,6 was in the second row and was the sixth person in the row.

3,1 meant the band member was in the third row and was the first person in the row.

The band had 14 rows of players. There were 7 players in each row.

A player had 8,5 on his hat.

1. How many band members were in rows ahead of him?  $(7 \times 7) 49$

2. How many band members were behind him?  $(6 \times 7) 42$

If you were a band member and had hat number 6,4,

3. how many players would be in rows behind you?  $(8 \times 7) 56$

4. how many players would be in rows ahead of you?  $(5 \times 7) 35$

5. how many players would be in front of you and to your right?  $(5 \times 3) 15$



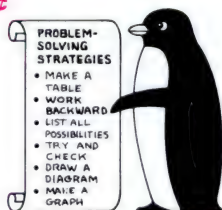


## BANANAS, APPLES, AND NUTS

Jane bought only apples and nuts for a salad.  
Harold bought only apples and bananas.  
Jane spent 31¢ and Harold spent 75¢.  
What did each one buy?



- How much would it cost Jane to buy 4 apples? **28¢**
- If Jane bought 4 apples and 2 handfuls of nuts, how much would she spend? **38¢**  
Is this more or less than 31¢? **More**
- What did Jane buy for 31¢?  
**3 apples and 2 handfuls of nuts**
- What did Harold buy for 75¢?  
**3 apples and 6 bananas**



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

## Using Problem-Solving Strategies

- Try and check.

### Introduction

By using try and check, students will determine the amount of each type of food that was bought. Basic multiplication and addition are necessary to solve these problems.

### Using the Page

To make sure students understand the problem, ask, "How much would it cost Jane to buy two apples? [14¢] 3 apples? [21¢] Can she buy anything else if she has 24¢ to spend?" [No]

The answer to Problem 1 is found by multiplying. [ $4 \times 7 = 28$ ]

Students solve Problem 2 by multiplying and adding. [ $4 \times 7 = 28$ ,  $2 \times 5 = 10$ ,  $28 + 10 = 38$ . 38¢ is more than 31¢.]

For Problem 3, students should use *try and check* to find the answer. Since 4 apples plus 2 handfuls of nuts cost more than 31¢, students must try other combinations that contain fewer apples or fewer nuts.

[Answer: 3 apples 21¢  
2 nuts + 10¢  
31¢]

For Problem 4, encourage students to use a systematic *try and check*. Harold would have to buy fewer than 9 bananas (9 cost 81¢). Students should work their way down from 9 bananas to find a combination that works.

[Answer: 6 bananas ( $6 \times 9$ ) 54  
3 apples ( $3 \times 7$ ) + 21  
75]

### Follow-Up

Students can make up similar problems using items and prices from grocery ads in your local newspaper.



## Using Problem-Solving Strategies

- Use physical models.
- List all possibilities.

### Materials

- Coins (Punchouts)

### Introduction

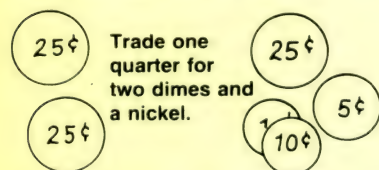
Students solve this problem by choosing coins for the machine and listing possible coin combinations.

### Using the Page

To make sure that students understand the problem, ask questions like, "Which coins can be put into the machine?" [Quarters, dimes, nickels] Can you put in more than one of each coin? [Yes, as long as the coins total 50¢]

[Quarters, dimes, nickels] Can you put in more than one of each coin? [Yes, as long as the coins total 50¢]

Students use a physical model by starting with 2 quarters and trading for coins with the same value.



For Problem 2, as they trade the coins, they should make a list of their findings. Help students make a chart and record their trades in a systematic way until they have listed all possibilities.

### Follow-Up

In how many different ways can you make change for a quarter using dimes, nickels, and pennies? [12]

### Answers

2.

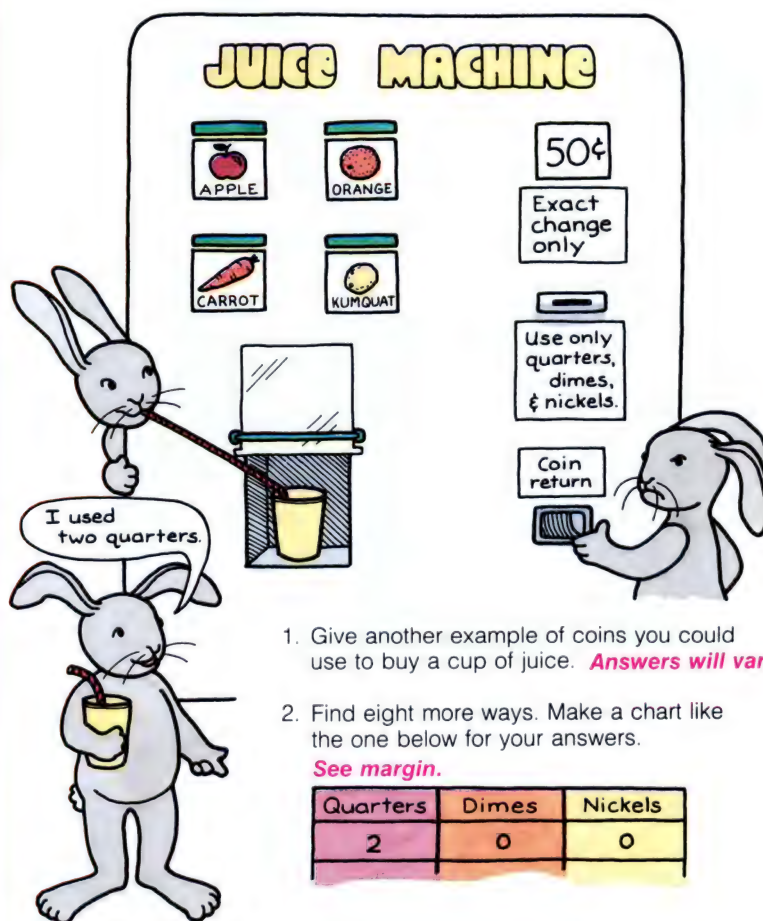
| Quarters | Dimes | Nickels |
|----------|-------|---------|
| 2        | 0     | 0       |
| 1        | 2     | 1       |
| 1        | 1     | 3       |
| 1        | 0     | 5       |
| 0        | 5     | 0       |
| 0        | 4     | 2       |
| 0        | 3     | 4       |
| 0        | 2     | 6       |
| 0        | 1     | 8       |
| 0        | 0     | 10      |

There are 10 possible coin combinations.

## Using Problem-Solving Strategies

# DRINK JUICE FOR A CHANGE

What coins can you use to buy a cup of juice from this machine?



1. Give another example of coins you could use to buy a cup of juice. **Answers will vary.**
2. Find eight more ways. Make a chart like the one below for your answers.

See margin.

| Quarters | Dimes | Nickels |
|----------|-------|---------|
| 2        | 0     | 0       |

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## WALTER'S ACCOUNT

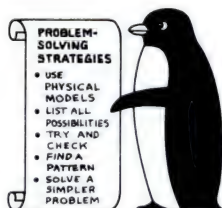
Walter's Aunt Betty decided to start a savings account for him.

She said she would put 1¢ in the account on the first day, 2¢ on the second day, 3¢ on the third day, and 4¢ on the fourth day. She would continue this pattern for 100 days.

Aunt Betty told Walter, "If you can tell me the total amount of money in your account after 100 days, I will double the total on the 101st day." How much money will Aunt Betty be giving Walter?



1. How much money would Walter have after 4 days? **10¢**
2. How much money would he have after 10 days? **55¢**
3. How much money would he have after 100 days? **\$50.50**
4. If Aunt Betty doubles the total amount of money, after 100 days how much will Walter have in the savings account? **\$101.00**



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## Using Problem-Solving Strategies

- Solve a simpler problem.
- Find a pattern.

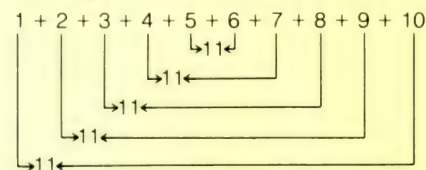
### Introduction

To find a solution to this problem, the student must add  $1 + 2 + 3 + 4 + 5 + \dots + 98 + 99 + 100$ . This could be done in a straightforward manner, but it would be tedious. To find an easier method, other problems that are similar except shorter will be examined.

### Using the Page

To answer Problem 1, students must add  $1 + 2 + 3 + 4$ . After students find this answer, have them look at combining pairs of addends to make the addition simpler. They may find that adding 1 and 4, then 2 and 3, gives them two 5s.

A similar technique can be used to find the answer to Problem 2. The first and last numbers add to 11. So do the second and ninth numbers, the third and eighth numbers, and so on.



Altogether, there are 5 pairs that add to 11. So, the sum is  $5 \times 11$  or 55. [55¢] Have the children add all the numbers to verify that this answer is correct.

Before attempting to answer Problem 3, you should solve another, simpler problem to find a pattern that will help them. Suppose, for example, the students added  $1 + 2 + 3 + \dots + 16$ . By adding the first and last numbers, the second and next-to-last numbers, and so on, they would see that there are 8 sums of 17. Since  $8 \times 17 = 136$ , the sum is 136.

The students should now be ready to answer Problem 3.

$$1 + 2 + 3 + \dots + 98 + 99 + 100$$

"What is the sum of the first and last numbers? [101] What is the sum of the second and next-to-last numbers? [101] How many times do we have 101? [50] What is the overall sum?" [50 × 101 = 5050] Walter would have \$50.50 in his savings account.

To answer Problem 4, multiply the answer to Problem 3 by two [\$101.00].



## Using Problem-Solving Strategies

- Draw a picture.

### Materials

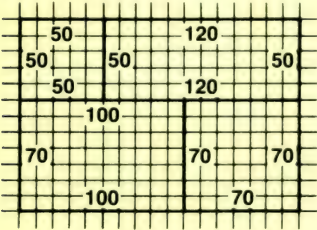
- Graph paper

### Introduction

Two of the lots are rectangular and two of them are square. Students will need to understand that opposite sides of a rectangle have equal lengths. Students will use addition to solve the problem.

### Using the Page

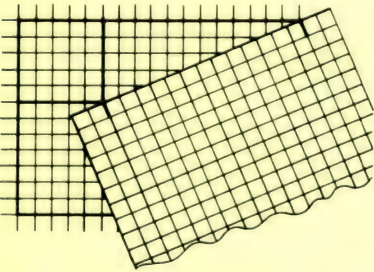
Help students *draw a picture* of the lots on graph paper. Let the side of one square on the graph paper represent 10 feet. Discuss what would represent 50 feet [5 squares] and 120 feet [12 squares].



By counting squares around the lots and then adding, students can answer Problem 1 [Labeled drawing above] and Problem 2 [870 feet].

To help students find the answer to Problem 3, have them arrange a piece of graph paper so that its edge joins one corner of lot 2 to the opposite corner. By counting squares, they can discover that Anita's brother would need about 130 extra feet of fence.

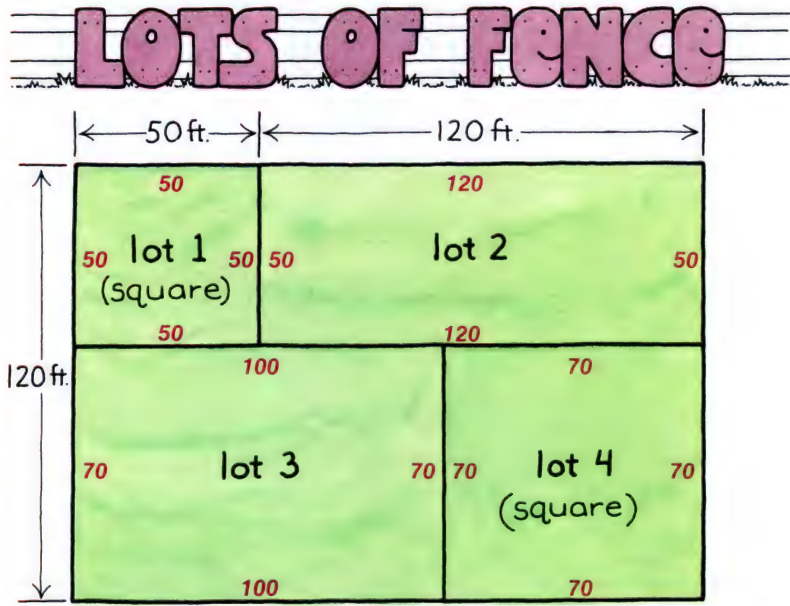
The picture below shows the placement of the graph paper for Problem 3.



### Follow-Up

Encourage students to make up similar puzzles and present them to the class.

## Using Problem-Solving Strategies



Anita's family has divided their property into 4 rectangular lots as pictured above. They plan to put a fence around each rectangle. Anita's mother asked her to figure out how many feet of fence they should buy.

1. Copy the lots above on grid paper. Label the lengths of all the sides of all the rectangles. **See above.**
2. How much fence is needed? **870 ft.**

Anita's brother also wants to put a fence from one corner of lot 2 to the opposite (diagonal) corner of lot 2.

3. About how many extra feet of fence would Anita's brother need? **About 130 ft.**



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## CUT IT OUT

When learning about area, Lucita's class cut rectangles out of grid paper, then compared the dimensions of the rectangles to their areas.

Lucita's twin sister, Rita, cut out a rectangle that was twice as long as it was wide. Rita's rectangle had an area of 18 square units.

Bill's rectangle was also twice as long as it was wide, but the width of his rectangle was exactly the same as the length of Rita's.

The rectangle that Ronald cut out was just as long as Bill's. Ronald's rectangle was 4 times as long as it was wide.

Lucita's rectangle was just as wide as Ronald's and twice as long as it was wide.

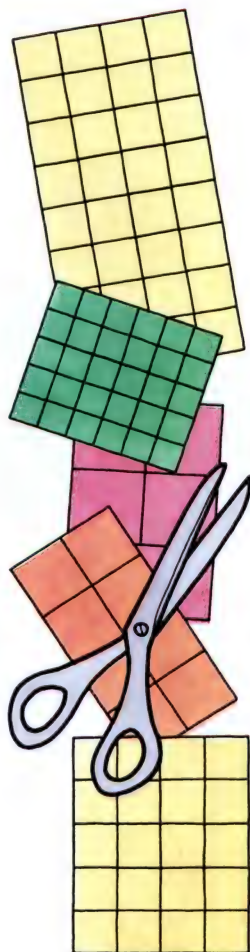
1. What were the dimensions of Rita's rectangle?  **$3 \times 6$**

2. What were the dimensions of Bill's rectangle?  **$6 \times 12$**

What was its area? **72 square units**

3. What was the area of Ronald's rectangle? **36 square units**

4. What was the area of Lucita's rectangle? **18 square units**



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## Using Problem-Solving Strategies

- Draw a picture.
- Try and check.

### Materials

- Grid paper (Teaching Aid K)

### Introduction

To solve these problems, students should attempt to draw rectangles like those described. First attempts to make rectangles like the ones described may be unsuccessful, so the students should try again. Students will also use basic multiplication facts.

### Using the Page

Pass out grid paper to your students. Have them attempt to *draw a picture* of a rectangle like Rita's on the grid paper. After trying to do this, have them check their rectangle to see if it is twice as long as it is wide with an area of 18 square units. Have them continue to *try and check* until they are successful.



For Problem 2, have the students read the description of Bill's rectangle and then draw a rectangle like Bill's on the grid paper. [ $6 \times 12$ ] After checking to see that it is really like Bill's, have them find the area. [72 square units]

For Problems 3 and 4, have the students follow a similar procedure to make a copy of Ronald's rectangle and then of Lucita's.

### Follow-Up

By drawing pictures on the grid paper, have students find out what happens to the area of a rectangle if the length of one side is doubled. [The area doubles.]

What happens to the area if you double the length of both sides? [The area becomes 4 times as great as the original area.]

Verify these results by examining several different-sized rectangles.



## Using Problem-Solving Strategies

- Use physical models.
- Use logical reasoning.

### Materials

- Containers with capacity of 3, 4, and 5 pounds
- Something to fill containers such as sand, rice, or beans

### Introduction

Students solve this set of problems by using logical reasoning and physical models.

### Using the Page

Students use *physical models* and/or *logical reasoning* to solve the 3 problems. Have students record on paper how they achieved their solutions. Allow students time to discover ways to get different amounts.

You may need to give students a hint to get them started. Say, "Fill the 4-pound can. Pour as much as you can into the 3-pound can. How much is left in the 4-pound can?" [1 pound]

### Answers

1. Fill a 4-pound can. Pour it into a 3-pound can. 1 pound remains.
2. Fill the 3-pound can. Pour it into the 4-pound can. Fill the 3-pound can again. Pour it into the 4-pound can until it's full. This leaves 2 pounds in the 3-pound can.
3. Fill the 3-pound can. Pour it into the 5-pound can. Fill the 3-pound can again, pour it into the 5-pound can leaving 1 pound in the 3-pound can. Empty the 5-pound can and pour in beans from the 3-pound can. Fill the 3-pound can and pour it into the 5-pound can. The 5-pound can now has 4 pounds in it.

or

Fill a 5-pound can. Pour it into a 3-pound can leaving 2 pounds in the 5-pound can. Empty the 3-pound can and pour the 2 pounds into the 3-pound can. Fill the 5-pound can and pour it into the 3-pound can. The 5-pound can now has 4 pounds in it.

## Using Problem-Solving Strategies

# SONNY'S HONEY



After school, Sonny helps in the food mart. For the honey sale, Sonny has to make up 2-pound jars of honey from larger containers of honey. Sonny can only find an empty 3-pound can and an empty 4-pound can. *How can he measure out 2 pounds at a time?*



1. Using only the 3-pound can and the 4-pound can, how can Sonny get 1 pound? *See margin.*
2. Using the same containers as in Problem 1, how can Sonny get 2 pounds? *See margin.*
3. If Sonny had only a 5-pound and a 3-pound can, how could he measure out 4 pounds? *See margin.*

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# INK SPOTS

Darlisa's parents own a company that builds patios out of square paving blocks. The patios are separated into rectangular sections with redwood boards.

Darlisa spilled ink on several of the patio plans, covering up some of the patio measurements. She had to figure out what numbers were covered by ink. Find the missing numbers for each patio plan.



1.

YOU CAN DO IT. HERE'S THE KEY. USE A PROBLEM-SOLVING STRATEGY.

PROBLEM-SOLVING STRATEGIES

- USE PHYSICAL MODELS
- LIST ALL POSSIBILITIES
- TRY AND CHECK
- DRAW A PICTURE
- SOLVE A SIMPLER PROBLEM

2.

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## Using Problem-Solving Strategies

- Draw a picture.
- List all possibilities.
- Try and check.

### Introduction

To solve these problems, students will need to find all the pairs of factors with a given product.

### Using the Page

In Problem 1, Section A of the patio has 5 blocks in one row. How many rows are there? The students can *draw a picture* to show the array.

$$\begin{array}{|c|c|c|c|c|} \hline & & & & \\ \hline \end{array} \times 5 = 10$$

$$2 \times 5 = 10$$

Each row of Section C also must have 5 blocks. Using  $5 \times 5 = 25$ , the number of rows is 5. Since Section B must have 2 rows, using  $2 \times 6 = 12$ , there are 6 blocks in each row. Similarly, Section D is found to have 6 blocks in each row.

Problem 2 is more difficult. Section E of the patio shows an array of 12 blocks. Students should *list all possibilities* of pairs of factors that have a product of 12: 1 and 12, 2 and 6, and 3 and 4. Thus the dimensions of Section E are 1 by 12, 2 by 6, or 3 by 4. The dimensions of Section F are 1 by 30, 2 by 15, 3 by 10, or 5 by 6. Since both Sections E and F have the same number of rows, these are the possibilities that exist.

|   |      |      |      |      |
|---|------|------|------|------|
| 1 | 12   | 30   | 6    | 15   |
| 2 | E 12 | F 30 | E 12 | F 30 |
| 3 | G    | H    | G    | H    |
| 4 | 20   | 50   | 20   | 50   |

Students should now *try and check* to determine the dimensions of Sections G and H. When they use 12 by 1 for Section E, they will find that no factor paired with 12 will give a product of 20 for Section G, nor will any factor paired with 30 give a product of 50 for Section H. Similarly, using 6 by 2 for Section E, there is no factor paired with 6 that will give 20, nor any factor paired with 15 that will give 50. If 4 by 3 is used for Section E,  $4 \times 5 = 20$  works for Section G and  $10 \times 5 = 50$  works for Section H. Thus, a 14-by-8 array will work. Likewise, with the last possibility,  $2 \times 10 = 20$  and  $5 \times 10 = 50$ . So, a 7-by-16 array will also work. Only the 14-by-8 array matches the scale drawing of the patio.



## Using Problem-Solving Strategies

- Make a table.
- List all possibilities.

### Introduction

Students will add, subtract, multiply, and divide when they solve this problem by listing all possibilities.

### Using the Page

Allow students to read the lesson. Then ask questions to make sure they understand the problem. "Can Mr. Penn buy 3 blue pencils? [No, he can only buy 4 at a time.] If he buys 2 boxes of blue pencils and 3 red pencils, how many pencils will he have? [11] If he wanted to buy 5 pencils, what two ways could he buy them?" [1 box of blue and 1 red or 0 blue and 5 red]

Students should now be able to make a table to list all possibilities of pencil purchases. Point out that Mr. Penn needs to buy at most 6 boxes of blue pencils. Find this by dividing 25 by 4 (in a box). [ $25 \div 4 = 6$ , remainder 1] He'll have  $(6 \times 4)$  or 24 blue pencils and must buy 1 red to make 25. ( $25 - 24 = 1$ .) This information is listed on line 1 of the table.

On line 2 of the table, one fewer box of pencils (5) is listed in the blue column. The number of red pencils is calculated to answer Problem 1. [ $5 \times 4 = 20$ ,  $25 - 20 = 5$ , 5 red pencils]

For Problem 2, students continue the listing process until the table is complete. [Mr. Penn has 7 choices.]

Problem 3 allows the students an opportunity to make a table and apply the listing process on their own. [Mr. Penn would have 9 choices.]

## Using Problem-Solving Strategies

# MR. PENN'S PENCILS

Mr. Penn wants to buy pencils for each of the 25 students in his fourth-grade class. How many different ways can he buy them?

PENCIL SALE

Make a table showing all of his choices.

The most boxes of BLUE he can buy is 6.

Then he'd have 24  $6 \times 4$  BLUE pencils.

He should buy 1 RED to total 25 pencils.

Here's how to write it in the chart.

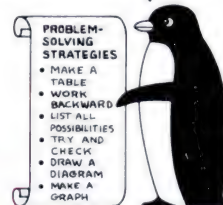
| Boxes of 4 blue pencils | Red Single pencils |
|-------------------------|--------------------|
| 6                       | 1                  |
| 5                       | 5                  |
| 4                       | 9                  |
| 3                       | 13                 |
| 2                       | 17                 |
| 1                       | 21                 |
| 0                       | 25                 |

1. If he buys 5 boxes of blue pencils, how many red pencils should he buy? **5**

2. Complete the table. How many choices does he have? **7 choices**

3. If blue pencils came 3 to a box, how many choices would he have? **9 choices**  
*See margin.*

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.



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### Answers

3.

| Boxes of 3 blue pencils | RED single pencils |
|-------------------------|--------------------|
| 8                       | 1                  |
| 7                       | 4                  |
| 6                       | 7                  |
| 5                       | 10                 |
| 4                       | 13                 |
| 3                       | 16                 |
| 2                       | 19                 |
| 1                       | 22                 |
| 0                       | 25                 |



## CHECKERS, ANYONE?

Cindy organized a checker tournament for her class.

Each player was to play one game against every other player.

8 students signed up to play.

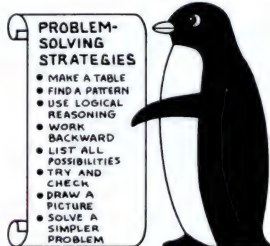
How many games did Cindy need to schedule?



Since each person had to play 7 others, Willy thought there would be  $8 \times 7$  games. Cindy thought Willy was wrong. She thought the tournament would be easier to schedule if she started with fewer players.

- How many games would be needed for 3 players? **3** 4 players? **6** 5 players? **10**
- Was Willy's method right? **No**
- How many games will be scheduled for 8 players? **28**

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.



## Using Problem-Solving Strategies

- Solve a simpler problem.
- Draw a picture.
- Make a table.
- Find a pattern.

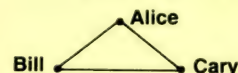
### Introduction

Students will draw pictures and record information from the pictures in a table to try to find a pattern for solving the problem.

### Using the Page

Ask your students if they think Willy was right. Allow them to express opinions freely without agreeing or disagreeing. Encourage them to give reasons for their opinions.

For Problem 1, solve a *simpler problem* by discussing a 3-player tournament. Show the names of 3 students on the board. Draw connecting lines representing the number of games they would play against each other.



How many games would be scheduled? [3] Would Willy's method give the right answer? [No]

Draw a picture for 4 players.



How many games need to be scheduled? [6] Does Willy's method give the correct answer? [No] Help the students make a table to record the results.

After the first 2 entries are put in the table, ask the students to predict the number of games to be scheduled for 5 players. Then draw a picture for 5 players to check the prediction.

| Number of players | Games to schedule | Willy's method    |
|-------------------|-------------------|-------------------|
| 3                 | 3                 | $3 \times 2 = 6$  |
| 4                 | 6                 | $4 \times 3 = 12$ |
| 5                 | 10                | $5 \times 4 = 20$ |

Some of the students will find a pattern from the table by observing that each of Willy's numbers needs to be divided by 2 to give a correct answer. These students can now find the number of games that need to be scheduled for 8 players. [ $8 \times 7 \div 2 = 28$ ]

Other students who do not use the pattern can continue to draw pictures to find the answer.



## Using Problem-Solving Strategies

- Use physical models.
- Solve a simpler problem.
- Try and check.

### Materials

- Scissors
- Clear tape

### Introduction

Students will first solve a simpler problem and then use try and check to find a solution to the puzzle.

### Using the Page

The cubes will provide the *physical model* for the students. To make the cubes, students should first trace, then cut out the four patterns, fold along the dotted lines, and tape. Students may want to make the cubes out of stiffer paper.

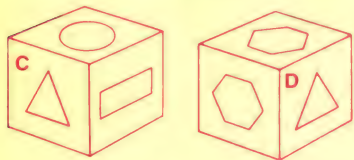
For Problem 1, have students place cubes A and B in front of them. Then ask them to turn their cubes so that the polygons are in the positions pictured on the worksheet.

"What shapes are on the bottom of A and B? [Hexagon and rectangle] On the back? [Rectangle and hexagon] Are there different shapes for each along the bottom? [Yes] Along the back? [Yes]" [Yes]

For Problem 2, have students use two cubes, C and D, to solve a *simpler problem*. Remind them that they will have to *try and check* different positions of the cubes to solve Problem 2.

### Answers

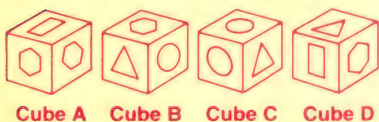
2. Solutions will vary. One possible solution is shown.



3. Solutions will vary. One possible solution is shown.



4. Solutions will vary. One possible solution is shown.

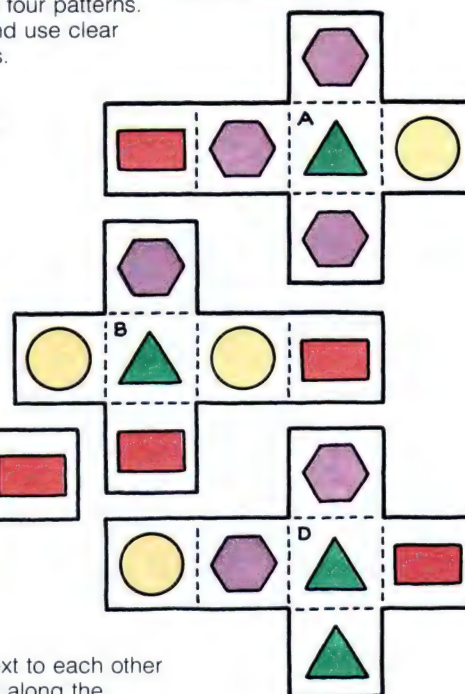
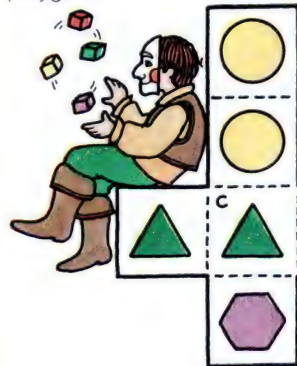


## Using Problem-Solving Strategies

# POLYGON PUZZLE

Trace, and then cut out these four patterns. Fold along the dotted lines and use clear tape to make them into cubes.

The object of the puzzle is to place the cubes next to each other in a row so that along the top, bottom, front, and back there is a different polygon.



1. First put cubes A and B next to each other to look like this. Notice that along the top and front there are 2 different polygons. Are the polygons different along the back? Along the bottom? **Yes; Yes**



2. Use cubes C and D to solve the puzzle. **See margin.**

3. Using cubes from Problem 1, arrange cube C to solve the puzzle. **See margin.**

4. Use all four cubes. **See margin.**

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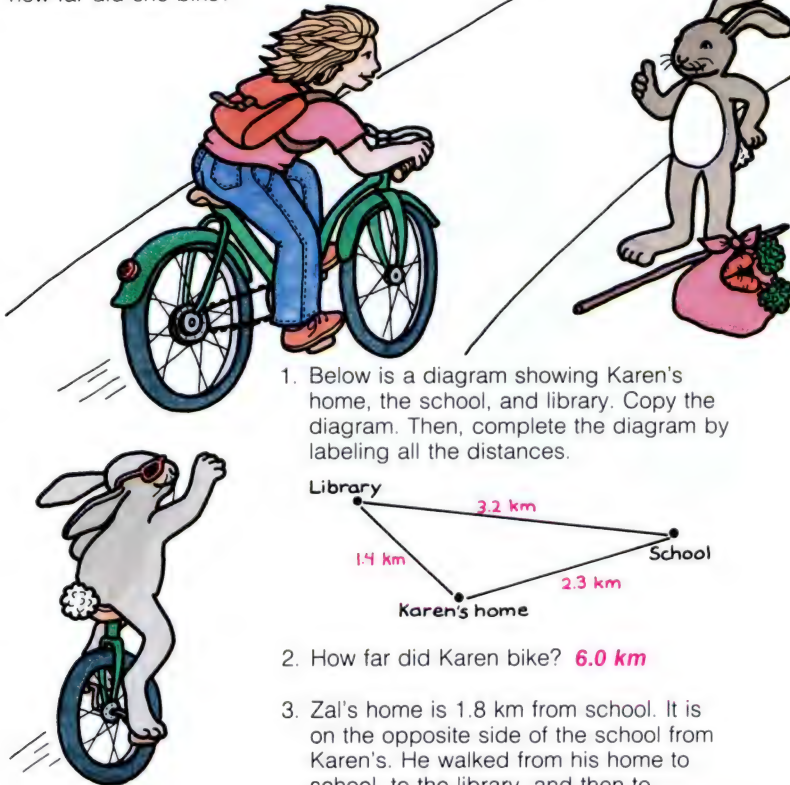
This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.



# KAREN GOES THE DISTANCE

From Karen's house, it is 2.3 km to school and 1.4 km to the library. It's 3.2 km from school to the library.

If Karen biked from home to school, back home, and then to the library, how far did she bike?



- Below is a diagram showing Karen's home, the school, and library. Copy the diagram. Then, complete the diagram by labeling all the distances.



- How far did Karen bike? **6.0 km**
- Zal's home is 1.8 km from school. It is on the opposite side of the school from Karen's. He walked from his home to school, to the library, and then to Karen's home. How far did he walk? **6.4 km**

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## Using Problem-Solving Strategies

- Make a diagram.

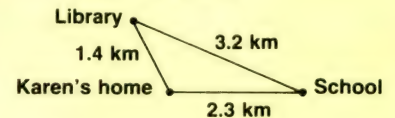
### Introduction

Students will add decimals and draw diagrams to find the solution.

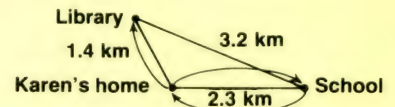
### Using the Page

Ask questions to make sure students understand the problem.

"How far is it from Karen's house to the library? [1.4 km] If Karen biked from home to the library and back home again, how would you find the distance she went?" [You would add.  $1.4 + 1.4 = 2.8$  km]

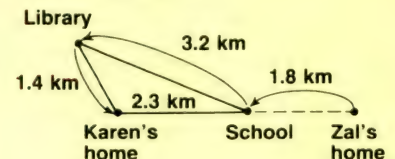


For Problem 2, remind the students that Karen backtracked home before she went to the library.



[Answer:  $2.3 + 2.3 + 1.4 = 6.0$  km]

Have students *make a diagram* for Problem 3 and then allow them to solve it on their own.



[Answer:  $1.8 + 3.2 + 1.4 = 6.4$  km]

### Follow-Up

If you can get a map which has mileage marked on it, make copies for your students to use when making up their own problems. (Your local Chamber of Commerce, real estate offices, and motor clubs, are good sources for maps.)



## Using Problem-Solving Strategies

- Make a table.
- Find a pattern.

### Introduction

Students will answer the questions by making and reading a table to find a pattern.

### Using the Page

Begin by asking the students, "How many thumbtacks are needed to attach one picture?" [4]

By looking at the diagram in Problem 1, students will see that the answer is 8. Problem 2 also involves looking at the diagram to see that the answer is 6. Now ask the students how many tacks are needed to attach 3 pictures in a line if the corners overlap. [8] After students have decided the least number of tacks needed to attach 1, 2, and 3 pictures in a line, have them *make a table* to list the information. Have them continue filling in the table until they get to 20 pictures, or until they *find a pattern*.

| Number of pictures | 1 | 2 | 3 |
|--------------------|---|---|---|
| Number of tacks    | 4 | 6 | 8 |

|    |    |    |    |
|----|----|----|----|
| 17 | 18 | 19 | 20 |
| 36 | 38 | 40 |    |

This must be 42.

### Follow-Up

How many tacks would be needed if the 20 drawings were very large and needed to be attached as follows:

|   |   |   |   |   |
|---|---|---|---|---|
| o | o | o | o | o |
| o | o | o | o | o |
| o | o | o | o | o |

[Answer: 63 tacks]

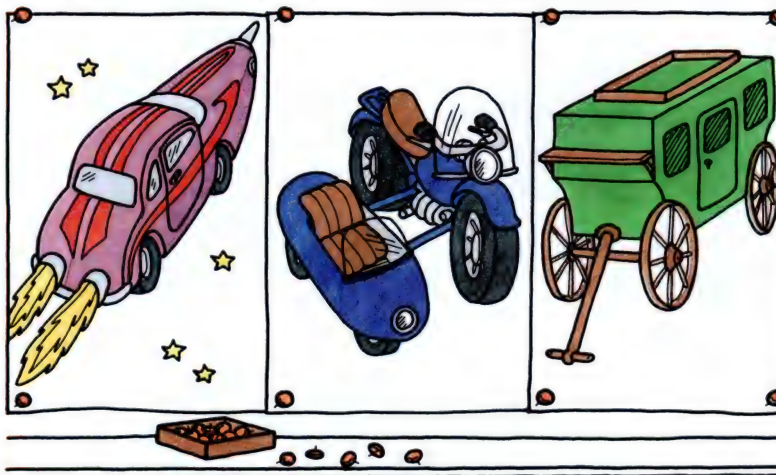
| Pictures   | 1 | 2 | 3  | 19 | 20 |
|------------|---|---|----|----|----|
| Thumbtacks | 6 | 9 | 12 | 60 | 63 |

## Using Problem-Solving Strategies

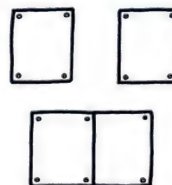
# THUMBTACKING A RIDE

The 20 students in Ms. Paul's fourth-grade class each drew a picture of a vehicle in which they would like to ride to school. What is the fewest number of thumbtacks she would need to attach the pictures in a line around the room.

Each corner must have a tack in it.



1. How many thumbtacks are needed to attach two pictures separately? **8**
2. How many tacks are needed to attach 2 pictures if the corners overlap? **6**
3. What is the fewest number of tacks needed to attach the 20 pictures in a line? **42**



YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.

**PROBLEM-SOLVING STRATEGIES**

- DRAW A PICTURE
- MAKE A TABLE
- USE PHYSICAL MODELS
- USE LOGICAL REASONING
- FIND A PATTERN



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# GENEROUS JENNIFER JUDSON

Jennifer Judson brought some peanuts with her to school one day.

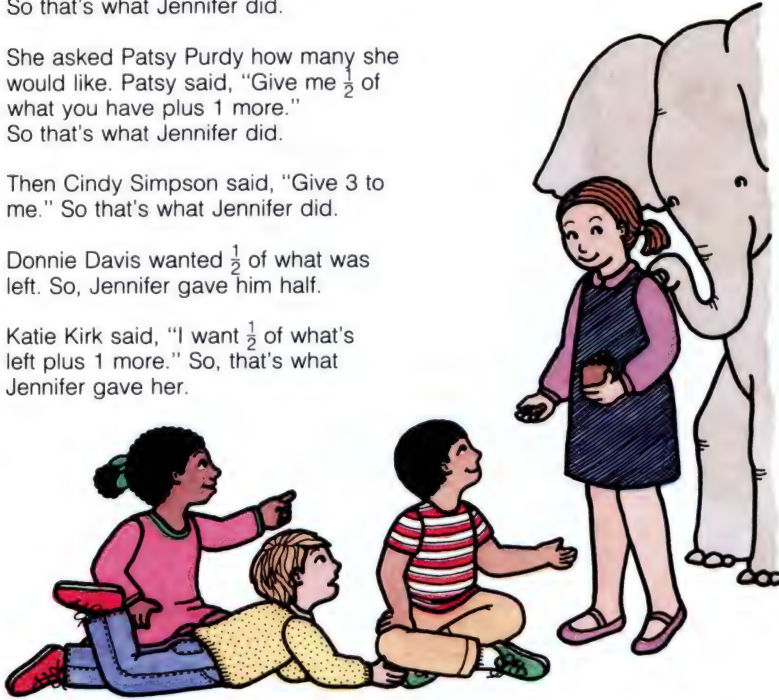
She asked Billy Baxter if he would like some peanuts. He said, "Yes, give me 8." So that's what Jennifer did.

She asked Patsy Purdy how many she would like. Patsy said, "Give me  $\frac{1}{2}$  of what you have plus 1 more." So that's what Jennifer did.

Then Cindy Simpson said, "Give 3 to me." So that's what Jennifer did.

Donnie Davis wanted  $\frac{1}{2}$  of what was left. So, Jennifer gave him half.

Katie Kirk said, "I want  $\frac{1}{2}$  of what's left plus 1 more." So, that's what Jennifer gave her.



When Jennifer saw that she only had 2 peanuts left, she thought, "I'm sure glad that I don't like peanuts."

How many peanuts did Jennifer start with? **40**

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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

## Using Problem-Solving Strategies

- Work backward.

### Introduction

To solve this problem, start with the two peanuts that Jennifer had left and "undo" the steps in reverse order. Students will use addition and the meaning of half a set.

### Using the Page

Begin by discussing the problem. Ask, "Was Jennifer really being generous? Since Patsy Purdy and Katie Kirk both got one-half of the peanuts plus 1 more, did they get the same amount?" [No]

"Start at the end of the problem and *work backward*. First, find how many peanuts Jennifer had before she gave some to Katie. Jennifer gave Katie half, then gave her 1 more. Imagine Katie giving them back to Jennifer. First replace the single nut. [ $2 + 1 = 3$ ] Then replace Katie's half. [ $3 + 3 = 6$ ] Thus, Jennifer had 6 peanuts before giving some to Katie. How many did she have before giving some to Donnie?"

"Jennifer gave Donnie half, leaving her with 6. That means that she gave 6 to Donnie. Replace what she gave to him." [ $6 + 6 = 12$ ]

"She gave Cindy 3 nuts. Replace those." [ $12 + 3 = 15$ ]

"Patsy took one-half plus 1 more. First replace the single nut. [ $15 + 1 = 16$ ] When Patsy took half there were 16 left which means she took 16. Replace them." [ $16 + 16 = 32$ ]

"Jennifer gave 8 nuts to Billy. Replace them to see how many she started out with. [ $32 + 8 = 40$ ] Jennifer started out with 40 nuts."

### Follow-Up

Ask, "Suppose Jennifer gave one-third of her peanuts to someone and was left with 8. How many did she start with?" Students could use try and check to find the original amount. Since she gave one-third of the peanuts to someone, she was left with two-thirds of the peanuts.  $\frac{2}{3}$  of some number equals 8. Then  $\frac{1}{3}$  of the number must be 4 peanuts. So she started with a total of  $8 + 4$  or 12 peanuts.



## Using Problem-Solving Strategies

- Make a picture.
- Make a table.

### Introduction

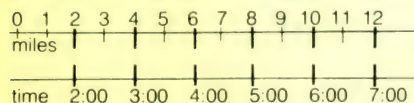
To solve this problem, students will divide a line segment into 12 equal segments, prepare a table showing hours of time from 1:00 P.M. to 6 P.M., and multiply whole numbers by  $\frac{1}{2}$ .

### Using the Page

Make sure the students realize that the hikers and Rick left from the same place but at different times. They followed the same trail and traveled in the same direction.

Allow students to try this problem on their own. If they need help for Problem 1, suggest that they *draw a picture* of the trail, mark off 12 one-mile segments, and indicate how far the hikers have walked at various times. A sample picture is shown below.

Miles traveled by hikers at given hours



For Problem 2, students could *make a table* to include the information from the picture in Problem 1 and the distances that Rick had ridden.

| Time | Miles hikers have walked | Miles Rick has ridden |
|------|--------------------------|-----------------------|
| 1:00 | started                  | not started           |
| 2:00 | 2                        | not started           |
| 3:00 | 4                        | not started           |
| 4:00 | 6                        | started               |
| 5:00 | 8                        | 6                     |
| 6:00 | 10                       | 12                    |

For Problem 3, students should use the table to determine that Rick caught up to the hikers sometime between 5:00 and 6:00.

To find the exact time required for Problem 4, they can extend the table to show distances for half-hour intervals. Students must realize that, in each half hour, the hikers walked  $\frac{1}{2}$  of 2, or 1 mile, and Rick rode  $\frac{1}{2}$  of 6, or 3 miles.

| Time | Miles hikers have walked | Miles Rick has ridden |
|------|--------------------------|-----------------------|
| 4:00 | 6                        | started               |
| 4:30 | 7                        | 3                     |
| 5:00 | 8                        | 6                     |
| 5:30 | 9                        | 9                     |

[Rick overtook the hikers at 5:30.]

## Using Problem-Solving Strategies

### ON THE TRAIL

At 1:00 this afternoon, some hikers started walking on the trail from Pinewood Camp to Timberline Camp which is 12 miles away. They walked 2 miles each hour.

At 4:00 P.M., Rick started from Pinewood Camp and followed the same trail as the hikers. He was on horseback and rode 6 miles each hour.

At what time did Rick overtake the hikers?



1. The hikers started at 1:00. How many miles had they walked by 2:00? by 3:00? by 4:00? by 5:00? by 6:00? **2 mi.; 4 mi.; 6 mi.; 8 mi.; 10 mi.**
2. Rick started at 4:00. How many miles had he ridden by 5:00? by 6:00? **6 mi.; 12 mi.**
3. Did Rick catch up to the hikers by 5:00? by 6:00? **No; yes**
4. At what time did Rick overtake the hikers? **5:30**

YOU CAN DO IT. HERE'S THE KEY. USE PROBLEM-SOLVING STRATEGIES.

PROBLEM-SOLVING STRATEGIES

- DRAW A PICTURE
- MAKE A TABLE
- USE PHYSICAL MODELS
- USE LOGICAL REASONING
- WORK BACKWARD



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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

### Follow-Up

You might ask these additional questions: How far were the hikers from Pinewood Camp when Rick overtook them? [9 miles] How long had the hikers been on the trail? [4- $\frac{1}{2}$  hours] Since it is 12 miles from Pinewood Camp to Timberline Camp, at what time will the hikers arrive at Timberline? [7:00] At what time will Rick arrive at Timberline? [6:00] How long did it take the hikers to get to Timberline? [6 hours] How long did it take Rick? [2 hours]



# BIRTHDAY BAR GRAPH

Which month of the year has the most birthdays?

1. Ask each of 30 people what his or her birth month is. Make a table of the months of the year, and list the 30 replies. **Answers will vary.**
2. Use the information in your table to complete a bar graph like the one below. **Answers will vary.**



3. In which month were the most people born? **Answers will vary.**
4. Compare your graph with the graphs of your classmates. Were the results the same? **Answers will vary.**

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This page is also available as a blackline master and as an overhead transparency in the *Problem-Solving Sourcebook*.

## Using Problem-Solving Strategies

- Make a table.
- Make a graph.

### Introduction

Students conduct a survey to determine the birth month of at least 30 people. They tally their results in a table and illustrate the data in a bar graph. Finally they compare their graphs with the graphs of their classmates.

### Using the Page

As a warm-up activity, you may wish to conduct a survey of birth months within the classroom. Have each student list his or her name and month of birth on the board. Have everyone *make a table* and tally the number of birthdays in each month.

| Month    | Number of birthdays |
|----------|---------------------|
| January  |                     |
| February |                     |
| March    |                     |
| .        | .                   |
| .        | .                   |

From this table, students can now *make a bar graph* to illustrate the data. Be sure each student understands how to determine the height of each bar. Finally ask, "In which month were the most people born?" [Answers will vary.]

Tell the class that Problem 1 asks students to conduct their own survey. Encourage them to ask their family, friends, and neighbors for their birth month. Students should make a list of the people they ask so that they are sure not to ask the same person twice. Once they have collected birth months of at least 30 people, they can make a table to tally the number of birthdays in each month.

For Problem 2, students should make a grid like the one on the pupil page to graph their results. [Graphs will vary.] They can answer the question in Problem 3 from their graph. [Answers will vary.]

Students can compare their graphs with the graphs of others in the class as asked in Problem 4. [Graphs will vary.] If you did the warm-up activity, you may wish to have students compare their graphs with the graph that was done in that activity. [Answers will vary.]

### Follow-Up

On a bulletin board have students make a large bar graph which combines the results of all the data collected by each class member.







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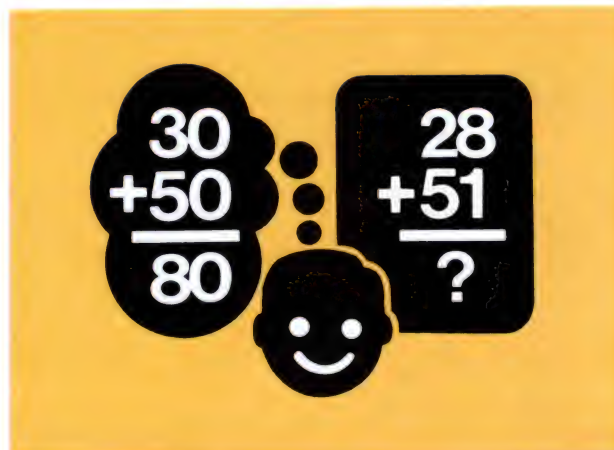
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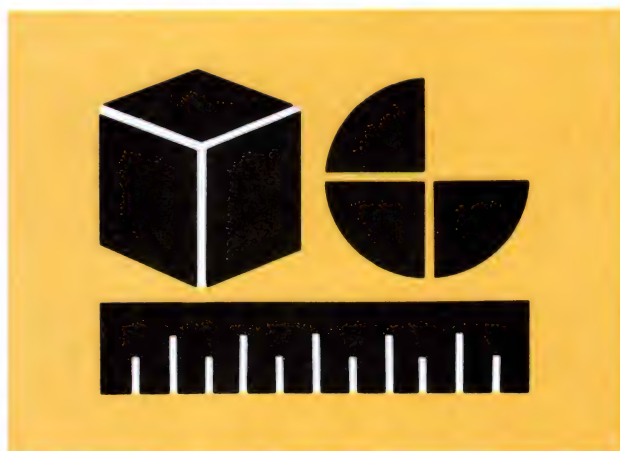
## Problem Solving



## Estimation and Mental Math



## Concrete Materials



## Calculators and Computers



## Thinking Skills



## Teaching Techniques





This section of the Teacher's Edition is designed to save you time by providing brief, capsule overviews of what *Invitation to Mathematics* offers in grades K-8 on some important topics in mathematics education today. You can use these pages as:

- A summary of Scott, Foresman's philosophy and approach to these topics to help you get a feel for the program in these areas.
- An in-service orientation on these topics to help you when you begin teaching *Invitation to Mathematics*.
- A professional sourcebook for teachers which can serve as a guide to further professional development in these areas.

Note that in front of every chapter is a discussion of many of these topics with information that is specific to that chapter.

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# A Five-Step Problem-Solving Method



## Rationale

The ability to solve mathematical problems is becoming increasingly important for success in many careers and in everyday life.

### A five-step problem-solving method can be a guide.

There is no magic formula or recipe for solving problems, no set of rules to be memorized. Solving a problem is more like taking a journey or going on an exploration. There may be more than one road that will lead to the answer. Some roads turn out to be dead ends. Sometimes you need to turn back and reread the problem. A five-step method like the one used in *Invitation to Mathematics* can guide students as they make this journey.

***There is no magic formula or recipe for solving problems, no set of rules to be memorized.***



## Main Ideas

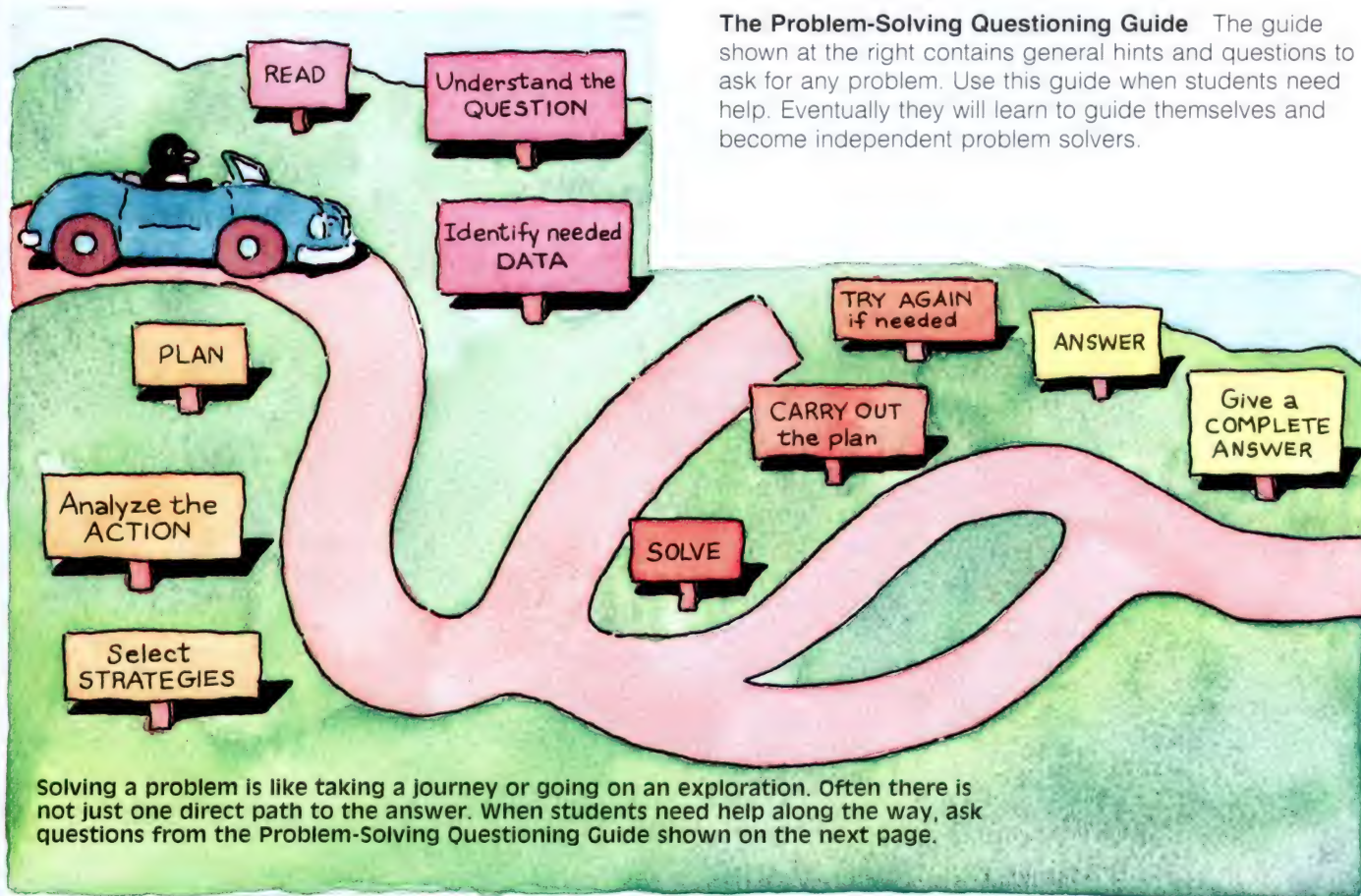
The five-step method used in *Invitation to Mathematics* is READ-PLAN-SOLVE-ANSWER-LOOK BACK. Many features of the program support this method.

**Problem-solving lessons** occur in all chapters. In grades 3–8, all the problem-solving lessons show all five steps. Each of these lessons places special emphasis on one of the steps. A box is drawn around that step on the text page.

**Daily problem-solving exercises** Problem solving occurs throughout the texts. Daily *Apply* problems in grades 3–8 use mixed operations and also feature:

- **Write a problem** exercises that require students to make up problems from given data.
- **Use data from . . .** exercises that require students to get data from a picture, table, and so on, in the lesson.
- **Find the facts** exercises that require students to get data from another page or from outside the text.
- **Starred** exercises which typically involve problems with too much information or multiple-step problems.

**The Problem-Solving Questioning Guide** The guide shown at the right contains general hints and questions to ask for any problem. Use this guide when students need help. Eventually they will learn to guide themselves and become independent problem solvers.







## Teaching Tips

Here are some tips for teaching problem solving.

### Create a positive classroom environment.

- Be enthusiastic. Alleviate students' anxieties.

### Encourage students to explain their thinking.

- Don't just ask for the answer.

### Read problems aloud sometimes.

- Have students read problems to each other.

### Personalize the problems.

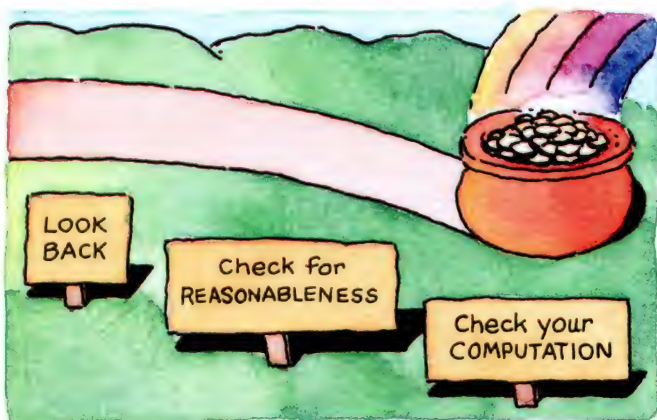
- Use students' names and names of local stores.

### Be cautious about using key words.

- Key words can be misleading. "How many in all?" can mean addition or multiplication. "How many left?" can mean subtraction or the remainder in division.

### Sometimes focus on one of the steps.

- **READ**—Give data. Ask students to make up a question. Give a problem with too little information. Ask students to identify the needed information.
- **PLAN**—Give a problem and cover up the numbers. Ask students just to choose the operation.
- **SOLVE**—Give a problem. Ask only for an estimate of the answer.
- **ANSWER**—Give a problem and the number part of the answer. Have students state the answer in a sentence.
- **LOOK BACK**—Give a problem and a possible answer. Ask students if the answer is reasonable.



## Problem-Solving Questioning Guide

### Read

Understand the QUESTION

- What are you asked to find?

Identify needed DATA

- What facts are given?
- Is there too much or too little information?
- Do you need to get data from a picture, table, or other resource?

### Plan

Analyze the ACTION

- Is this a one-step problem?
- Is this a multiple-step problem?
- Will something other than computation be needed?

Select STRATEGIES

- Which strategies will help?
- |                         |                |
|-------------------------|----------------|
| Choose the operation    | Make a table   |
| Find a pattern          | Try and check  |
| Write an equation       | Work backward  |
| Draw a picture          | Use estimation |
| Use logical reasoning   | Use ratios     |
| Use physical models     | Make a graph   |
| List all possibilities  | Use a formula  |
| Solve a simpler problem |                |

### Solve

CARRY OUT the plan

- Give an estimate of the answer.
- Can the computation be done mentally? with paper and pencil?

TRY AGAIN if needed

- Is your plan working? If not, go back to the Read and Plan steps.

### Answer

Give a COMPLETE ANSWER

- Is rounding needed?
- Give the answer in a sentence.

### Look Back

Check for REASONABLENESS

- Did you answer the question?
- Did you use all needed data?
- Does your answer make sense?

Check your COMPUTATION

- Is the answer close to the estimate?
- Did you compute correctly?



# Problem-Solving Strategies

## WHY

### Rationale

School cannot expose students to every type of mathematical problem they are going to encounter in their lives. However, school can prepare them to face those problems by teaching them problem-solving strategies.

**Strategies give students tools to use with any problem.**

The strategies students use to solve one problem can be applied to new problems.

**Strategies reinforce higher order thinking skills.** When students look for patterns or use logical reasoning or solve a simpler problem, they are practicing the kind of critical thinking skills that are valuable in all subject areas.

## WHAT

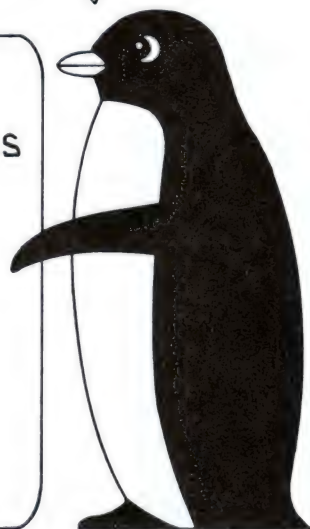
### Main Ideas

*Invitation to Mathematics* teaches the problem-solving strategies shown at the right.

YOU CAN DO IT. HERE'S  
THE KEY. USE PROBLEM-  
SOLVING STRATEGIES.

#### PROBLEM-SOLVING STRATEGIES

- DRAW A PICTURE
- MAKE A TABLE
- FIND A PATTERN
- TRY AND CHECK
- USE LOGICAL REASONING
- WORK BACKWARD



The problem-solving penguin appears in grades 3–8 to guide students through the problem-solving journey and encourage them to use problem-solving strategies.

## Problem-Solving Strategies

**Choose the operation(s)** Often used with simple word problems and multiple-step problems.

**Find a pattern** Includes numerical and geometric patterns. Often used in conjunction with making a table.

**Write a number sentence or equation** Develops students' ability to translate real-world situations into mathematical language.

**Draw a picture or diagram** Helps students understand problems as well as find solutions.

**Try and check** Involves more than random guessing. Being systematic is encouraged.

**Make a table** Is often a helping strategy that enables students to organize data, look for patterns, and make conjectures.

**Use logical reasoning** Helps students solve a variety of mathematical puzzle problems.

**Use physical models** Includes using concrete materials and acting out a problem.

**List all possibilities** Helps students organize their thinking.

**Work backward** Is especially helpful when a final result is given and something prior to that result needs to be determined.

**Use estimation** Is valuable when an exact answer is not needed or not possible.

**Solve a simpler problem** Includes similar problems and problems with smaller numbers.

**Use ratios** Is effective for solving some multiple-step problems.

**Make a graph** Helps students picture information, read values between and beyond known points, and use crossing graphs to determine when a faster object passes a slower one.

**Use a formula** Reinforces algebraic solutions to mathematical problems.





**Routine problems** are ones that can be solved by adding, subtracting, multiplying, or dividing. To help students choose the correct operation(s), encourage them to analyze the action in the problem. Here are some actions commonly found in problems, especially in the lower grades. An understanding of these actions begins with a meaningful development of basic facts.

### Choosing the Operation

|                        | When groups are part of a total   | When groups are being compared              |
|------------------------|---|---|
| Addition actions       | Joining groups to find a total  | Adding on the difference to find the larger |
| Subtraction actions    | Taking away to find a group that's left or missing  | Comparing to find the difference            |
| Multiplication actions | Joining equal groups to find a total  | Using "times as many" to find the larger    |
| Division actions       | Sharing equally to find the size of each group<br>Forming groups of a given size to find the number of groups | Comparing to find how many "times as many"  |

**Nonroutine problems**, or process problems, are ones that cannot be solved by simply adding, subtracting, multiplying, or dividing. They require critical thinking and use of problem-solving strategies. *Invitation to Mathematics* provides these problems in:

**Problem-Solving Lessons**  
**Using Problem-Solving Strategies Pages**  
**Math Posters**  
**Problem-Solving Sourcebooks**  
**Strategies in Problem Solving Courseware**

The lesson notes in grades 3–8 suggest open-ended, applied problems in *Situational Lessons* at the beginning of chapters and in *Motivational Situations* at the beginning of lessons.



### Teaching Tips

The teacher's role is important in helping students successfully use problem-solving strategies.

#### Be a facilitator, not a directive leader.

- Give hints sparingly. Ask leading questions.

#### Emphasize perseverance, not speed.

- Tell them that being temporarily perplexed is OK.

#### Focus on the process.

- Praise students' thinking.
- Ask "How did you do it?" type questions.

#### Be a role model for problem solving.

- Think aloud as you solve a problem.
- Show your false starts and alternative plans.

***The teacher's role is important in helping students successfully use problem-solving strategies.***

#### Encourage alternative approaches.

- Emphasize there is not just one right way to do it.
- Ask if someone used a different approach.

#### Encourage interaction.

- Have students work together in groups at times.

#### Reward risk taking and playing hunches.

- Spur students on even when they're not sure.
- Ask for conjectures.

#### Evaluate more than the answer.

- Give partial credit for understanding the problem and using reasonable approaches.
- See the suggestions for evaluating problem solving later in this "Spotlight" section.

#### Have a problem-solving bulletin board.

- Post a problem of the week or problem of the day. Use the math posters.
- Have students bring in examples of problems.
- Have students display their solutions. Post folded hints for students to take as needed.



# Estimation Concepts and Strategies

WHY

## Rationale

The ability to estimate is often very important.

### Estimate to check if a computed answer is reasonable.

It's easy to make an error when computing with paper and pencil or to push a wrong button on a calculator. Estimating answers before, during, and after computing helps students find their mistakes.

### Estimate when an exact answer is not possible or not practical.

It's not possible to know how many fish are in the ocean or to predict exactly how many shoes will be sold next year. And it's not practical to count the leaves in a forest. So estimation is used.

### Estimate when an exact answer is not needed.

In everyday life, an exact answer is often unnecessary. You estimate when you're in a store and need to know if you have enough money for certain items or when you need to know about how long a car trip will be.

***In everyday life, an exact answer is often unnecessary.***

**Estimation reinforces other concepts.** Estimation is not only a valuable tool. It also reinforces number sense, place value, and problem solving.

How long is the table? Well, I know that a sheet of paper is 11 inches long. So I'll see how many sheets fit along the table.



One good estimation strategy in measurement is to compare an item to something with a known measure.

WHAT

## Main Ideas

*Invitation to Mathematics* teaches a variety of estimation strategies in measurement and computation.

### Estimation Strategies in Measurement

**Making reasonable guesses** Students estimate measures and choose sensible measures. This begins in primary grades where students get a feel for words like *about*, *around*, and *almost*. Estimates can be expressed as a single number (about 8 meters) or as a range (between 5 and 10 meters).

#### Comparing to something with a known measure

If you know a sheet of paper is 11" long and about 5 sheets fit along a table, the table is about 55" long. On a map, if 1 cm represents 500 km and two cities are about 7 cm apart, the cities are actually about 3,500 km apart.

**Sampling and predicting** To find the number of beans in a jar, count the beans in 1 scoop and multiply by the number of scoops. To estimate the cost of meals on a trip, estimate the cost for 1 day and multiply by the number of days. Survey 20 students and ask a question. Then use the results to estimate results for the whole school. Toss a paper cup 100 times and use the results to predict for 1,000 tosses.

**Reading graphs and tables** Graph known values or read a table with known values. Then estimate unknown values that are in between or beyond the known values.



### Estimation Strategies in Computation

**Using rounding** Several methods are used.

Round to one  
nonzero digit.

$$\begin{array}{r} 425 \\ \times 28 \\ \hline \end{array} \longrightarrow \begin{array}{r} 400 \\ \times 30 \\ \hline \end{array}$$

Round to the  
same place.

$$\begin{array}{r} 28.4 \\ - 3.9 \\ \hline \end{array} \longrightarrow \begin{array}{r} 28 \\ - 4 \\ \hline \end{array}$$

You can also round both numbers up and both numbers down to get a range when adding or multiplying.

**Using front-end digits** Ignore everything but the first digits. Then adjust the estimate.

$$\begin{array}{r} 173 \\ 421 \\ + 348 \\ \hline \end{array} \longrightarrow \begin{array}{r} 100 \\ 400 \\ + 300 \\ \hline 800 \end{array}$$

$73 + 21 + 48$   
is more than 100,  
so the sum is  
more than 900.

**Substituting compatible numbers** Substitute numbers that are close to the original numbers and can be worked with mentally.

$$23 \overline{)476} \longrightarrow 24 \overline{)480} \text{ or } 23 \overline{)460} \text{ or } 25 \overline{)500}$$

$$\frac{1}{3} \times 187 \longrightarrow \frac{1}{3} \times 180$$

$$26\% \text{ of } 32 \longrightarrow 25\% \text{ of } 32 = \frac{1}{4} \times 32$$

$$24 \times 78 \times 4 \longrightarrow 25 \times 78 \times 4 = 100 \times 78$$

**Using clustering** Use this when all the numbers are close to the same number.

$$\begin{array}{r} 6278 \\ 6589 \\ 5893 \\ + 6134 \\ \hline \end{array}$$

About  $4 \times 6,000$

$$3\frac{7}{8} + 4\frac{1}{5} + 3\frac{2}{3}$$

About  $3 \times 4$

**Comparing to a reference point** Compare the numbers to numbers you can work with mentally.

$$\begin{array}{r} 46 \\ + 38 \\ \hline \end{array}$$

Both numbers are  
less than 50. So  
the sum is  
less than 100.

$$\frac{3}{8} + \frac{2}{5}$$

Both are less  
than  $\frac{1}{2}$ . The sum  
is less than 1.

**Teaching when to use estimation** Students are reminded to estimate whenever they compute and to "Look Back" to see if answers to problems are reasonable. *Choosing a Computation Method* exercises in grades 3–8 give students practice in deciding when an estimate is all that is needed.



### Teaching Tips

**Do estimation as you introduce the lesson.**

- Ask students for estimates.
- Give 3 estimates and have students choose the best.
- Ask if the answer will be less than some number.
- Give an estimate and ask if it is reasonable.
- Frequently ask students to estimate measurements.

**Have students give group estimates.**

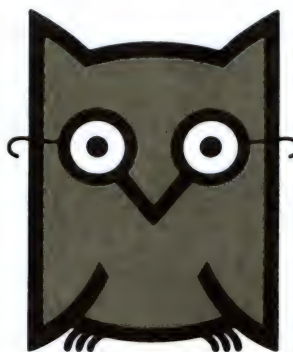
- See which group can give the best estimate.
- Average several students' estimates.
- Have students discuss how they got their estimates.

**Emphasize techniques more than terminology.**

- It's important for students to learn estimation strategies, but it's not important for them to memorize terms like *front-end* or *compatible*. These are not math vocabulary terms, but simply descriptive names for estimation techniques.

**Use the estimation work in the program.**

- Lessons with "Estimation" in the title
- Examples that teach estimation strategies
- Specially-flagged estimation exercises in grades 3–8
- *Choosing a Computation Method* exercises in grades 3–8
- Specially flagged lesson notes on estimation
- Estimation activities on some of the math posters



**Be smart.  
Estimate when  
you calculate.**

This estimation owl appears in the text in grades 3–8 to teach estimation strategies and remind students to estimate whenever they do computation.



# Mental Math Concepts and Strategies



## Rationale

The ability to compute mentally is an important basic skill.

**Mental math is efficient.** For basic facts and simple calculations like  $24 + 30$  or  $85 \times 10$ , mental math is the fastest and most accurate way to get the answer.

**Mental computation strategies are used by adults.** People use a variety of mental math strategies in their everyday lives to do calculations like  $47 + 29$  or  $5 \times 99$  in their heads. It's important to teach these strategies in school.

**People use a variety of mental math strategies in their everyday lives.**

**Basic-fact strategies help students learn facts.** After students acquire a conceptual understanding of basic facts, they need to memorize the facts. Students who have trouble can use a variety of basic-fact strategies to help them recall a fact until it is memorized.

**Mental math is necessary for estimation.** Students need mental math in order to estimate answers to computations.

**Mental math reinforces other concepts.** Mental math enhances students' number sense and improves their understanding of place value, properties, and computation.



Compute mentally.  
Use your mind  
to save time.

This mental math cat appears in grades 3–8 to teach mental math strategies and remind students to use mental math.



## Main Ideas

*Invitation to Mathematics* teaches strategies for recalling basic facts and doing mental computation.

### Basic-Fact Strategies

#### For addition facts

**Commutative property** For  $3 + 5$ , use  $5 + 3 = 8$ .

**Counting on** When one addend is 1, 2, or 3. For  $3 + 6$ , start with 6. Count on 3 more.  $6 \dots 7, 8, 9$ .

**Using doubles** When addends are 1 apart (near doubles) or 2 apart (skippers). For  $7 + 8$ , use  $7 + 7 = 14$ . Plus 1 more is  $15$ . For  $4 + 6$ , jump in the middle, 5, and double it.  $5 + 5 = 10$ .

**Adding 0** Any number plus 0 is that number.

**Adding 8 or 9** For  $9 + 7$ , add 1 to 9 (to get 10) while subtracting 1 from 7.  $10 + 6 = 16$ . For  $8 + 5$ , add 2 to 8 (to get 10) while subtracting 2 from 5.  $10 + 3 = 13$ .

#### For subtraction facts

**Families of facts** For  $9 - 4$ , use  $4 + 5 = 9$ .

**Counting back** When subtracting 1, 2, or 3. For  $8 - 2$ , start with 8. Count back 2 more.  $8 \dots 7, 6$ .

**Counting up** When numbers are 1, 2, or 3 apart. For  $7 - 4$ , start with 4. Count up to get to 7.  $4 \dots 5, 6, 7$ . You counted up  $3$ .

**Subtracting 0** Any number minus 0 is that number.

**Subtracting 8 or 9** For  $16 - 9$ , add 1 to both numbers.  $17 - 10 = 7$ . The answer is 1 more than the 6 in 16. For  $13 - 8$ , add 2 to both numbers.  $15 - 10 = 5$ . The answer is 2 more than the 3 in 13.

#### For multiplication facts

**Commutative property** For  $7 \times 6$ , use  $6 \times 7 = 42$ .

**Skip counting** For  $3 \times 5$ , count 3 fives. 5, 10,  $15$ .

**Adding on to a known product** For  $6 \times 6$ , use  $5 \times 6 = 30$ . Add 1 more 6 to get  $36$ .

**Doubling** For  $8 \times 6$ , find 4 sixes,  $4 \times 6 = 24$ , and then double that,  $2 \times 24 = 48$ .

**Multiplying by 9** For  $9 \times 8$ , subtract 1 from the 8 to get the first digit of the answer, 7. Subtract that 7 from 9 to get the last digit, 2.  $9 \times 8 = 72$ .

#### For division facts

**Families of facts** For  $63 \div 7$ , use  $7 \times 9 = 63$ .



**Mental-Computation Strategies**

**Looking for special numbers** Look for special numbers like 1, 10, 100, or 3, 30, 300.

$$45 + 30 \quad 267 - 4 \quad 28 \times 100 \quad 180 \div 60$$

Look for combinations that give special numbers.

$$3 + 79 + 7 \quad \text{Use } 3 + 7 \text{ to get } 10. \quad \frac{1}{3} \times 5 \times 12 \quad \text{Use } \frac{1}{3} \times 12 \text{ to get } 4.$$

**Using compensation** Change one number to make it easy to use. Change the answer to compensate.

$$57 + 29 \quad \text{Add 1 to 29 to get 30. Subtract 1 from the answer. } 57 + 30 = 87. 87 - 1 = \underline{86}.$$

$$165 - 97 \quad \text{Add 3 to 97 to get 100. Add 3 to the answer. } 165 - 100 = 65. 65 + 3 = \underline{68}.$$

$$28 \times 50 \quad \text{Multiply 50 by 2 to get 100. Divide the answer by 2. } 28 \times 100 = 2,800. 2,800 \div 2 = \underline{1,400}.$$

Change one number to make it easy to use. Change the other number to compensate.

$$66 + 19 \quad \text{Add 1 to 19 to get 20. Subtract 1 from 66. } 65 + 20 = \underline{85}.$$

$$157 - 98 \quad \text{Add 2 to 98 to get 100. Add 2 to 157. } 159 - 100 = \underline{59}.$$

$$24 \times 25 \quad \text{Multiply 25 by 4 to get 100. Divide 24 by 4. } 6 \times 100 = \underline{600}.$$

**Breaking apart numbers** Break apart one number.

$$54 + 23 \quad \text{To add 23, add 20 then 3. } 54 + 20 = 74. 74 + 3 = \underline{77}.$$

$$87 \times 2 \quad \text{To find 87 twos, find 80 twos and 7 twos. } 80 \times 2 = 160. 7 \times 2 = 14. 160 + 14 = \underline{174}.$$

Break apart both numbers.

$$35 + 48 \quad \text{Add 30 and 40. Add 5 and 8. Add the sums. } 30 + 40 = 70. 5 + 8 = 13. 70 + 13 = \underline{83}.$$

**Using equivalent forms** Change percents, decimals, and fractions. Divide to find "fraction of."

$$\frac{1}{3} \text{ of } 18 \quad \text{Find } 18 \div 3. \quad 25\% \text{ of } 32 \quad \text{Find } \frac{1}{4} \times 32.$$

**Teaching when to use mental math** Several factors affect when we use mental math.

- **Is the problem easy?** Basic facts like  $3 + 4$  and easy problems like  $56 + 20$  should be done mentally.
- **Can a mental-computation strategy be used?** Some problems can be done mentally using strategies.
- **How good are you at mental math?** Some people can compute with large numbers in their head. Everyone can get better at this with practice, but not all people reach the same level of proficiency.
- **Are other computation tools available?** We stretch our mental math abilities and do harder problems when paper and pencil or a calculator are not handy.

Exercise sets called *Choosing a Computation Method* in grades 3–8 focus on when to use mental math.

**Teaching Tips**

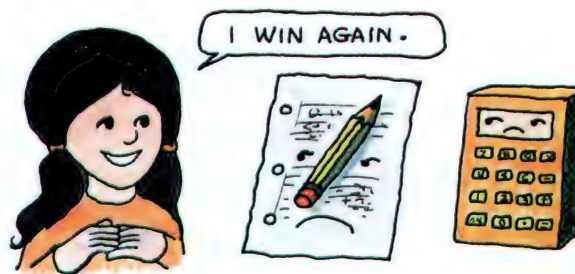
Here are some ways to help students learn mental math.

**Have mental math workouts.**

- Present written and oral mental math exercises.
- Have timed drills for basic facts, starting with plenty of time and then shortening the time.

**Use the mental math features in the program.**

- Lessons and examples on mental-math strategies
- A story in grade 1 on basic-fact strategies
- *Using Basic-Fact Strategies* pages in grades 1–2
- Special mental math exercises in grades 3–8
- *Choosing a Computation Method* in grades 3–8
- Special lesson notes on mental math
- Mental math worksheets in the Teacher's Resource File



To show the speed of mental math, give easy problems, and have some students use paper and pencil, some use calculators, and some use mental math.



# Using Concrete Materials to Develop Understanding



## Rationale

Using concrete materials to teach math concepts has many benefits.

**Concrete materials help develop understanding.** When students understand the concepts related to a math word or symbol or procedure, they perform better and feel more confident.

**Concrete materials help students become better problem solvers.** Many everyday problems involve real objects. Students will be able to apply their math skills to such problems more successfully, if those skills have been developed using objects.

**Concrete materials help students who are having trouble.** When students have trouble performing at a symbolic level, going back to concrete experiences can help them overcome their difficulties.

**Concrete materials help make mathematics more interesting.** When students learn mathematics as meaningless manipulations of abstract symbols, they may feel that math is dull and forbidding. Activities with concrete materials get students involved and make learning mathematics more enjoyable.

I hear, and I forget.  
I see, and I remember.  
I do, and I understand.



When developing concepts with concrete materials, don't rely on explanations or demonstrations alone. For best results, let students work with the objects themselves.



## Main Ideas

Concrete materials for the activities described in *Invitation to Mathematics* can be found in many places. For example, when an activity calls for "counters," you can use objects from any of the sources shown below.

### Sources of Concrete Materials

#### Ordinary objects brought into the classroom

- Beans
- Popsicle sticks
- Cartons



Cylinder

#### Objects already in the classroom

- School supplies
- Desks
- Students



$$\begin{array}{r} 3 \\ + 4 \\ \hline \end{array}$$

#### Mathematics kits

- Manipulatives made of wood or plastic  
A kit is available for each grade, K-8



23

#### Punchout manipulatives

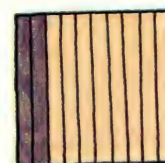
- Laminated tagboard  
Individual student sets are available for each grade, K-8.



$\frac{3}{4}$

#### Teaching aids

- Blackline masters  
These are available for each grade, K-8.



0.2





**When to use concrete materials** Activities with concrete materials are suggested in the lesson notes throughout *Invitation to Mathematics*.

- **When introducing a concept** This can occur when the topic is introduced for the first time in the program or for the first time in a particular grade.
- **When remediation is needed** Many suggestions for re-teaching involve concrete materials. A student in any grade may function well at the symbolic level in one area but need to work at the concrete level in another.
- **In upper grades as well as lower grades** Students benefit from work with concrete materials when introduced to topics such as percent, ratio, geometric formulas, integers, and equation solving.
- **With all strands** Concrete materials can be used with all strands. They are particularly important in strands like measurement and geometry where students may need to literally feel an object to understand its length, weight, shape, and other characteristics.
- **In Story Activities at grades K–2** First, students hear a delightful math story that describes story characters working with objects. Then the students do activities related to the story and get to work with objects themselves.



For a very effective way to develop understanding of key concepts in grades K–2, use the read-aloud Math Stories in the back of the Teacher's Edition. Then use the Story Activities that are suggested.



## Teaching Tips

Here are some suggestions for effective ways to do activities with concrete materials.

**Have students use the objects directly.** Don't do teacher demonstrations only. Students will learn more and feel more involved if they do the activities themselves. The punchouts provide each student with a set of manipulatives.

**Have students explain their thinking as they do the activities.** This will help them think more clearly. It will also give you an idea of how well they understand and where they might need extra help.

---

***The punchouts provide each student with a set of manipulatives.***

---

**Use a variety of ways to show a concept.** For example, do activities that show fractions using parts of regions (shaded circles, fraction bars), parts of sets, and number lines (rulers).

**Develop understanding of operations as well as numbers.** Do activities with objects joining (addition) and being taken away or compared (subtraction). Do activities that help students understand each step in a computational procedure.

**Tell stories with some activities.** Make up stories or have students make up stories in which counters represent horses, spaceships, or whatever interests the students. You might personalize the stories: "Suppose Chris has 4 cats . . ."

**Have an activities table in the corner.** When only a few students need more reinforcement of concepts with concrete materials, you can send them to the activities table for additional work.

**Use an overhead projector.** When teacher demonstration is necessary, an overhead projector helps you do an activity that the whole class can see. It also lets you watch the students working with their materials at the same time. Paper, punchouts, small objects, or see-through materials can be used effectively with an overhead projector.



# Using Pictures to Develop Understanding

WHY

## Rationale

Using pictures to represent mathematical concepts is helpful in many ways.

**Pictures provide a bridge from concrete to symbolic experiences.** Pictures of objects remind students of activities with objects.

**Pictures help students become better problem solvers.** Real-world problems often involve pictures. If concepts are developed using pictures, students will have more success using pictures in problem solving.

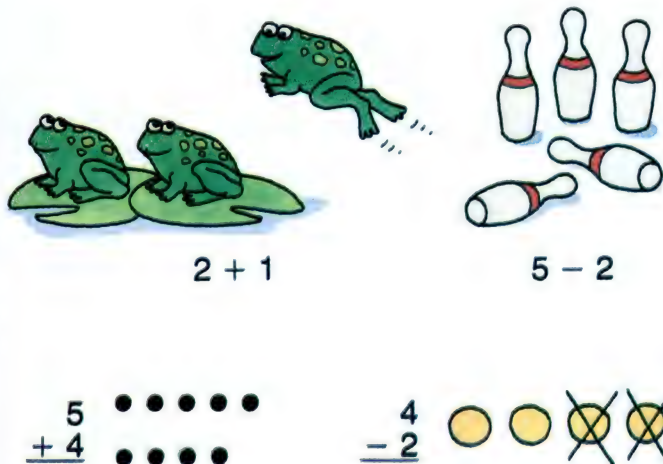
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***Pictures provide a bridge from concrete to symbolic experiences.***

---

**Pictures help students who are having trouble.** When students are having trouble at the symbolic level, going back to pictures can help.

**Pictures make textbooks powerful learning tools.** A good textbook can supply many pictorial representations of mathematical ideas. This kind of book is a better teaching aid than one that supplies little more than plain, abstract exercises.



*Invitation to Mathematics* shows many pictorial representations of math concepts. Note that *all* addition and subtraction basic facts are introduced through pictures in each of grades 1 and 2.

WHAT

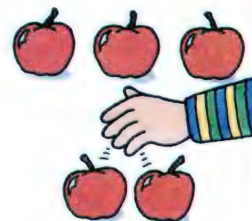
## Main Ideas

Pictures can be used effectively as part of a concrete-pictorial-symbolic teaching strategy.

### CONCRETE

#### Activities with objects

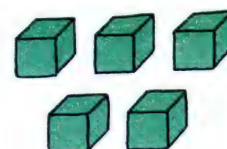
- Ordinary objects
- Math manipulatives



### PICTORIAL

#### Pictures of objects

- Pictures of ordinary objects
- Pictures of math manipulatives
- Tally marks, dots, diagrams, and so on.



### SYMBOLIC

#### Abstract practice

$$\begin{array}{r} 3 \\ + 2 \\ \hline \end{array}$$



This is Theodore Bear. He introduces place value in a story at grade 1. Then he appears with objects in the book to help students make the transition to the text page.





## Teaching Tips

**When to use concrete, pictorial, and symbolic experiences.** It's important to provide students with all three types of experiences and to help them make connections from one type to another.

- **Begin with concrete experiences.** Many students learn best when their initial introduction to a topic is through concrete experiences.
- **Don't move to symbolic work too quickly.** Stay with concrete and pictorial experiences until students have a good grasp of the concepts. If you push for mastery on abstract practice too quickly, students might be mastering errors that are the result of poor understanding.
- **Go back to concrete or pictorial experiences when students are having trouble.** Do reteaching using objects or pictures, or ask students to check their work using objects or pictures.
- **Eventually have students move back and forth between concrete, pictorial, and symbolic experiences with ease.** In real life, people use all 3 types of experiences. For example, when planning carpeting for a room, you might go back and forth between measuring the room, using a drawing, and doing computations. After students have had all 3 types of experiences, help them make transitions by giving them one type of experience (for example, a math sentence) and asking them to show it another way (with pictures or objects).

Here are some ways to get maximum benefit from the many pictures found in *Invitation to Mathematics*.

**Discuss the pictures in the text with the students.**

As you introduce the lesson, draw attention to the pictures. Sometimes ask students to explain what is going on in the picture.

**Be sure students understand actions shown in the pictures.** Since objects pictured on a printed page can't move, be sure students understand any actions (joining, separating, and so on.) that are depicted. Use objects, if necessary, to make the action clear.

**Be aware of students who have trouble visualizing 3-dimensional objects from drawings.** Help these students by discussing the pictures and by going back to actual objects, if necessary.

**Make the pictures come alive by telling stories.** Make up stories to go with the pictures or have students tell stories. This is particularly helpful in primary grades where the amount of text on the page is limited.

**Discuss the pictures related to the Math Stories (grades K–2) and the place-value bears (grades 3–5).**

*Invitation to Mathematics* shows story characters and place-value bears on the text pages to remind students that the mathematics in the lesson is related to the stories and to activities with concrete materials.

Remember hundreds, tens, and ones.  
and you'll understand how it's done.



This is the place-value bear for whole numbers in grades 3–5. It appears when examples using small numbers are shown with place-value blocks. It appears again by examples with large numbers to remind students that the same concepts underlie work with large numbers.

Remember hundredths, tenths, and ones.  
and you'll understand how it's done.



This is the place-value bear for decimals in grades 3–5. It helps remind students that place-value concepts for whole numbers also apply to decimals. The unit squares on the bear's shirt are often used in activities and pictures that develop an understanding of decimals.



# Calculators in Mathematics Education



## Rationale

Using calculators in math class has many advantages.

**Calculators can be teaching aids.** Calculators can help you teach many concepts from many strands. This makes them valuable teaching aids, just as concrete materials, flashcards, and chalk are teaching aids.

**Calculators save time.** By using calculators as a computational tool during problem solving, measurement, geometry, and so on, students can do more work in these areas in less time. So it's easier for you to cover all the topics you need to cover. Slower students can finish assignments within time limits, and all students can spend more time doing higher order thinking.

**Calculators improve problem-solving ability and attitude.** With calculators, students can explore interesting problems that would be too tedious to do otherwise. With calculators, students can focus on the problem-solving process more and can try more strategies for solving a problem.

**Calculators prepare students for adult life.** Calculators are used everywhere in the everyday world—in homes and on the job. Work with calculators in school will prepare students for their future.



## Main Ideas

*Invitation to Mathematics* incorporates calculators into the program in several important ways.

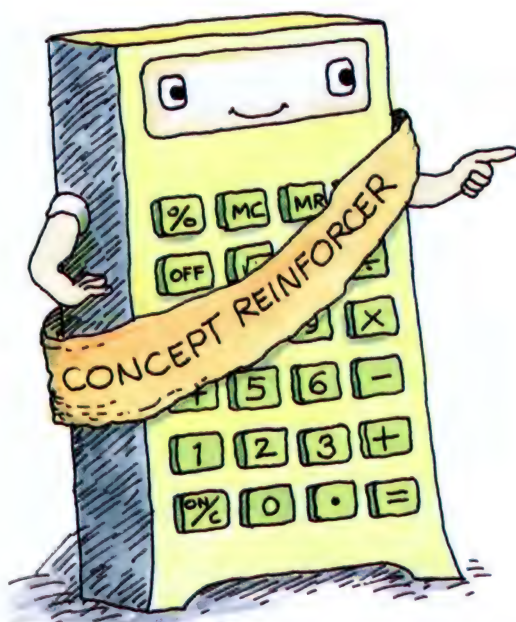
**Using calculators to reinforce concepts** A variety of exercises and exploratory activities throughout the program reinforce concepts. Some examples are given in the picture below.

**Using calculators in problem solving** There are problems in the text and there are lesson notes about problem solving which are especially suited for use with a calculator and are labeled that way. However, the use of calculators in problem solving need not be restricted to those places. Anytime you let students use calculators in problem solving, you give them a chance to focus on the problem-solving process without getting bogged down by computation. As always, it is important for students to estimate to make sure their answers are reasonable.

---

***Any time you let students use calculators in problem solving, you give them a chance to focus on the problem-solving process without getting bogged down by computation.***

---



**Counting** Press 2  $+$  2  $=$   $+$  2  $=$   $+$  2  $=$ .  
What is happening? What comes next?

**Place Value** Enter 7,189. Change the 1 to a 6 without clearing the calculator. Then change the 8 to a 5.

**Division** Find  $3,761 \div 42$  using only the number keys and the  $\div$  and  $=$  keys.

**Estimation** Use three of the numbers 12, 15, 28, 31, and 44 to get a product of 10,416. Estimate and use your calculator to check.

Calculator activities can be used to help you reinforce concepts from many strands.



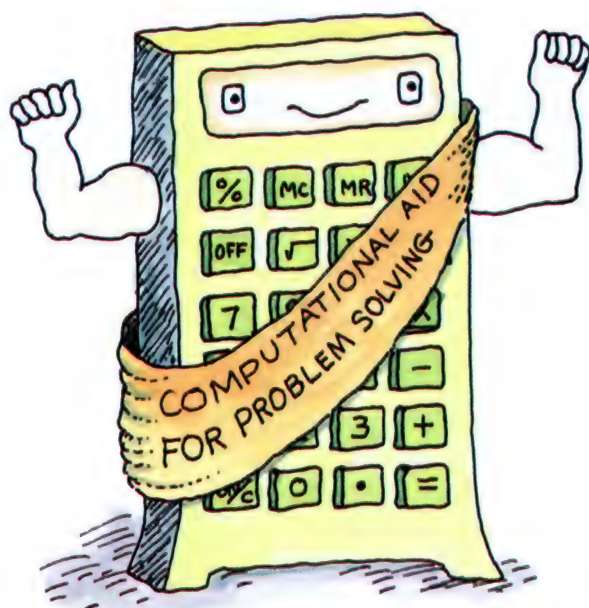


**Teaching when to use a calculator** In real life, many factors affect a decision to use a calculator.

- **How tedious is the computation?** For problems with large numbers or many numbers, calculators are faster and more accurate than paper and pencil.
- **Can it be done mentally?** Calculators should not be used for basic facts or simple problems like  $20 \times 30$ .
- **How handy is the calculator?** If the calculator is in a drawer or another room or another building, it may be faster to use paper and pencil.
- **Is the problem already written down?** If the problem is already on paper, it may be faster to use a pencil than to enter the numbers on a calculator.

The more chances students have to make these decisions, the better prepared they will be to make them in real life. *Choosing a Computation Method* exercises in grades 3–8 focus on when to use a calculator.

The numbers are large?  
There are lots of numbers?  
You've got higher order  
thinking to do? Let me help.



Valuable time can be saved by using a calculator as a computational aid during problem solving.

**Teaching how to operate a calculator** The calculator materials in the program help students learn how their particular calculators operate. Students have opportunities to explore questions like the following.

- **Reading a display** How many digits are in the display? What happens when the answer has 15 digits? If you add 2.10 and 3.20, do you see 5.3 or 5.30? If you divide 2 by 3, do you see 0.6666666 or 0.6666667?
- **Special calculator keys** What special keys are on your calculator and how do they work—clear, clear entry, change sign, memory, percent, square root?
- **Special key sequences** If you press  $2 \div 3 \times 4 =$ , do you get 20 or 24 for an answer? What happens if you press  $2 \div 3 = = =$  or  $2 \times 3 = = =$ ?



## Teaching Tips

Here are some answers to commonly asked questions about using calculators in teaching mathematics.

### What grade level?

- You can begin with exploratory activities in primary grades and use calculators more in higher grades.

### What type of calculator?

- No one type is best. Some teachers prefer all students to use the same type. Some prefer a variety of types so that this variety can be explored.
- Solar powered calculators eliminate the need for batteries. Special key sequences are often desirable.

### How many calculators?

- Either 1 or 2 students per calculator works well.

### What does *Invitation to Mathematics* offer?

- Material in the text labeled "Calculator," grades 1–8
- Special lesson notes on calculators, grades 1–8
- *Choosing a Computation Method* grade 3–8
- Calculator worksheets, grades 1–8



# Computers in Mathematics Education



## Rationale

Computers can benefit mathematics education in many ways.

**Computers can be teaching aids.** Computers can save teachers time by assisting with (not taking over) many aspects of mathematics teaching. Computers can:

|                    |                           |
|--------------------|---------------------------|
| Give explanations  | Give more practice        |
| Show examples      | Help students explore     |
| Present exercises  | Help with problem solving |
| Control difficulty | Make up tests             |
| Give hints         | Grade tests               |
| Check answers      | Analyze test results      |
| Show solutions     | Prescribe remediation     |
| Say "Try again"    | Keep records              |
| Give rewards       | Determine grades          |
| Decide to reteach  | Prepare reports           |
| Decide to move on  |                           |

**Computers can motivate students.** Working with computers is intrinsically rewarding for many students, and computer software often includes rewards (animation, musical tones, and so on.).

**Computers can help individualize instruction.** Students can progress at their own rate, while the computer grades their work and monitors progress. Computers have infinite patience.

**Computers can use pictures to teach concepts.**

Computers can show pictures of objects, move the objects, and let students move the objects.

**Computers can do more than a printed page.** They can interact with students, provide immediate feedback, show motion, and even speak.

### Computer Programming

Reading and writing computer programs in BASIC or Logo can help:

**Reinforce skills and concepts.** When students read and write programs on a topic, they understand that topic better.

**Use the computer as a tool.** To help with teacher demonstrations and student explorations, computer programs can make graphs, tables, and drawings and do repetitive procedures. Prewritten programs to be keyed in and preprogrammed software can also be used this way.

### Computer Awareness

A good way to give students information about computers in math class without taking time away from teaching math is to include this information in word problems. The information can be about:

- Uses of computers
- Capabilities of computers
- Parts of computers
- History of computers
- Careers with computers

### Computer-Assisted Instruction

Several types of software help students learn mathematics.

**Drill and practice** The computer generates exercises, checks answers, and may give hints or rewards or show solutions.

**Tutorials** The computer teaches and gives exercises and may do reteaching.

**Games** A computer game uses mathematics.

**Problem solving** The computer presents problems. Students try various strategies.

**Simulations** The computer simulates an experiment (tossing a coin 1,000 times).





## Main Ideas

There are several ways that computers can be involved in mathematics education. Some of these are described on the computer screens on these two pages.



## Teaching Tips

Here are some things to consider when you decide to use computers in school.

### Selecting a computer

- First decide how you want to use the computer.
- Then look at factors like available software, amount of memory, cost, ease of use, compactness, speed, graphics capabilities, resolution of the screen, disk drives, type of printer, and servicing.

### Evaluating software

- Is it instructionally sound? Is it well sequenced? Is there interaction and immediate feedback? Can the student control the pace?
- Is the screen clear and easy to read? Are graphics, sound, color, and animation (if any) used to enhance learning?

### Ways to arrange computers in classrooms

- You might have students go to a computer room or bring the computers into class on carts.
- For teacher demonstrations, you might use a big-screen monitor or network (hookup) the students' computers to the teacher's computer.

### What does *Invitation to Mathematics* offer?

- For computer awareness, the topics listed on the previous page are in lesson themes at grades 3–8 and in some of the computer worksheets at grades 1–2.
- For computer programming, there are math-related BASIC and Logo activities in the grade 3–8 texts to be done with or without a computer. There are computer worksheets at grades 1–8 that can be used with any computer. The computer feature and computer worksheets are independent of each other. Use one or the other or both as you wish. You can use them when suggested or group them into mini-units.
- For computer-assisted instruction, the *Mathematics Courseware Series* offers excellent tutorials (K–8). The *Mathematics Action Games* (K–8) and *Strategies in Problem Solving* packages (3–8) are also excellent.
- The *Computer Management System* (K–8) offers all the features listed at the left below.
- A *Test and Worksheet Generator* for grades 7–8 offers all the features listed below.

### Computer Management System

A good computer management system can:

**Score tests**, giving raw-scores and percentage scores.

**Analyze test results**, determining objectives mastered.

**Prescribe remediation**, telling where to find materials for reteaching.

**Determine grades** based on weighted test scores and other factors.

**Print reports** about one student, a class, a school, or a district.

### Test and Worksheet Generator

A computer can be used to print out tailor-made tests and worksheets. It can:

**Print alternate forms** by changing the numbers. Through random generation and descriptions of items, the computer essentially never runs out of items.

**Print different types of tests** including chapter and cumulative tests.

**Focus on specific subskills** by breaking objectives into problem types.

**Print references** to lessons or objectives that are keyed to the items.



# Teaching Thinking Skills in Mathematics

## WHY

### Rationale

A good mathematics program can enhance a student's ability to think. Mathematics encompasses a variety of thinking skills from simple recall of facts to higher order thinking involved in complex problem solving. As technology grows and machines are able to do more of the rote tasks, it is more important for people to be able to do higher order thinking.

***As technology grows and machines are able to do more of the rote tasks, it is more important for people to be able to do higher order thinking.***

## WHAT

### Main Ideas

There are many different ways of classifying and naming thinking skills in elementary mathematics. *Invitation to Mathematics* uses the scheme shown below. Some examples are given on the next page. Note that higher order thinking skills are sometimes also called critical thinking skills.

**Higher order thinking in mathematics is closely tied to problem solving.** Higher order thinking is involved when one formulates problems, analyzes problems, develops plans for solving them, carries out the plans, and looks back to interpret the results.

**Higher order thinking in mathematics is closely tied to logic.** Higher order thinking involves logical reasoning. In elementary mathematics, this is done informally in problem solving, providing readiness for formal proofs in high school.

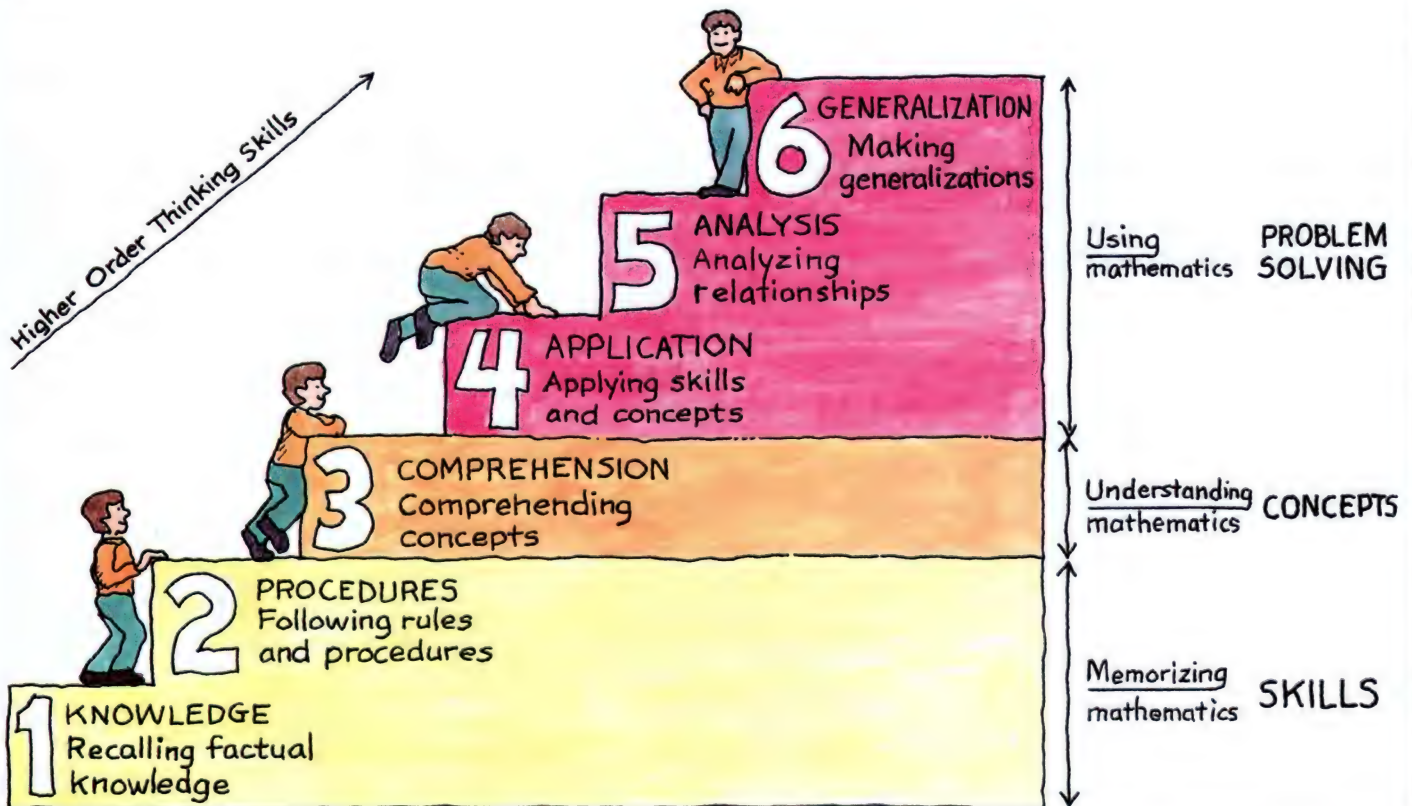
**Many factors affect students' ability to do higher order thinking.** Students' attitudes and knowledge, as well as their beliefs about mathematics, about their own abilities, and about the teacher's expectations affect how well they think.

**"Higher order" does not always mean "harder."**

Making a generalization uses a different kind of thinking than following a procedure. But a simple generalization like finding the rule for 2, 4, 6, 8 . . . is easier than a hard procedure like long division.

**Many tasks require a variety of thinking skills.**

Tasks requiring higher order thinking often involve lower order thinking as well.







## Teaching Tips

Here are some ways to emphasize higher order thinking.

### Develop concepts as you teach.

- Use concrete materials and pictures effectively.
- Explain why a rule or procedure works.
- Check for understanding, not just proficiency.

### Use the *Thinking Skills* exercises.

- These exercises in grades 3–8 are designed to focus on higher order thinking skills.

### Emphasize problem solving.

- Focus on the problem-solving process. Do nonroutine problems that use problem-solving strategies.
- Include open-ended problems as in the *Situational Lessons* at the beginning of chapters in grades 3–8.

### Create a classroom atmosphere that encourages thinking.

- Praise students' thinking, not just right answers.
- Ask questions and give responses that promote further thinking. See the next page for a discussion of this.

## Thinking Skills in Elementary Mathematics

### Level 1: Recalling factual knowledge

- Remembering basic facts
- Knowing mathematical words and symbols

### Level 2: Following rules and procedures

- Doing computation
- Comparing, ordering, and rounding numbers
- Solving equations
- Reading and making tables and graphs
- Making measurements
- Estimating sums, products, differences, quotients

### Level 3: Comprehending concepts

- Understanding why a rule or procedure works
- Understanding meanings of operations
- Recognizing examples of place-value concepts, fraction concepts, area concepts, and so on.

### Level 4: Applying skills and concepts

- Choosing an operation to solve a problem
- Writing an equation to solve a problem
- Writing ratios to solve a problem
- Selecting a formula to solve a problem
- Making up simple problems

### Level 5: Analyzing relationships

- Selecting relevant data to solve a problem
- Identifying when there is too little information to solve a problem
- Formulating subproblems for a complex problem situation
- Making a table, graph, or picture to solve a problem
- Listing all possibilities to solve a problem
- Using a systematic try-and-check approach to solve a problem
- Working backward to solve a problem
- Using deductive reasoning to make valid inferences and apply generalizations
- Interpreting results after solving a problem

### Level 6: Making generalizations

- Finding a pattern to solve a problem
- Solving a problem by first solving a simpler problem
- Using inductive reasoning to formulate and test hypotheses (try other instances, look for counter-examples, and so on.)
- Making decisions and judgments
- Evaluating alternative strategies for solving a problem



# Questioning and Responding



## Rationale

Asking good questions and giving good responses to students' answers helps students learn, gets them involved, and helps you assess their understanding.



## Main Ideas

### Characteristics of good questions

- Ask questions that help develop higher order thinking skills—ones that encourage students to:

|                       |                                  |
|-----------------------|----------------------------------|
| Explain               | "How do you know that . . . ?"   |
| Tell why              | "Why did that work . . . ?"      |
| Apply generalizations | "Give an example of . . ."       |
| Explore alternatives  | "Is there another way . . . ?"   |
| Pose questions        | "Make up a problem . . ."        |
| Interpret results     | "Is that reasonable . . . ?"     |
| Analyze relationships | "How are these alike . . . ?"    |
| Experiment            | "How could you find out . . . ?" |
| Make conjectures      | "What would happen if . . . ?"   |
| Make generalizations  | "Make up a rule for . . ."       |

- Avoid too many questions that involve just recall.

### Characteristics of good responses

- Give responses that promote further thinking. Ask for clarification, ask why it worked, or ask for another approach. Refer students to other resources to help them become independent learners.
- Accept students' answers without giving responses that discourage the students.
- Sometimes after a student gives an answer (right or wrong), ask the rest of the class or another student to react. Encourage students to listen to each other.



## Teaching Tips

### Style of questioning

- Pause after asking a question so that all students have a chance to think.
- Avoid calling on one student too often. The others may tune out. Try to involve the whole class.
- Avoid asking a student who is misbehaving. It may only serve to alienate that student.

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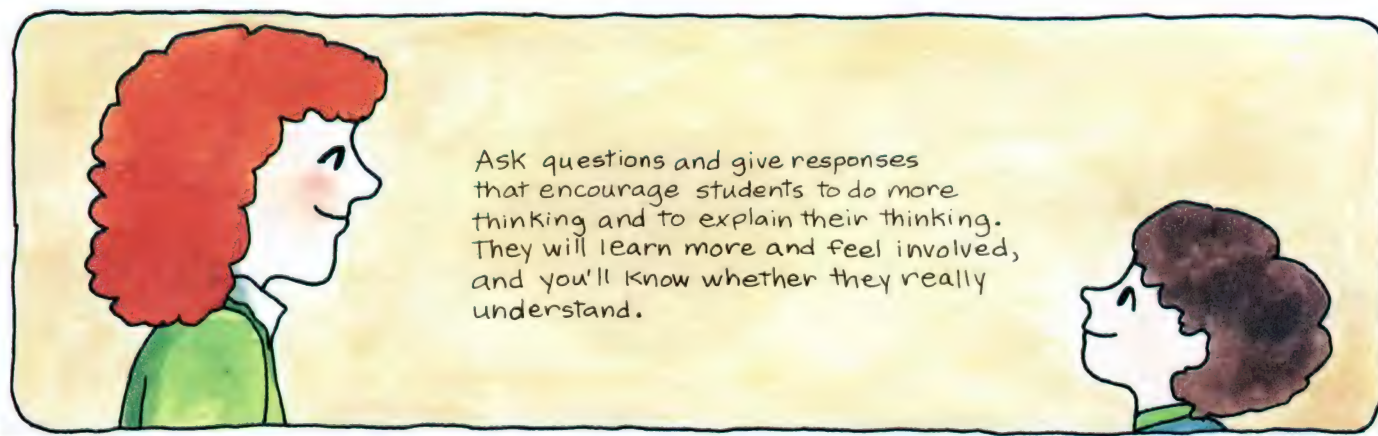
***Pause after asking a question so that all students have a chance to think.***

---

- Sometimes have each student whisper the answer to you so that the students won't be embarrassed and you can hear from all the students.
- Sometimes have each student signal agreement (thumbs up), disagreement (thumbs down), or not sure (thumbs to the side).
- Sometimes ask for a written response. Then walk around the room and quickly check the answers. As students' written answers improve, they will feel braver about answering verbally.

### Style of responding

- Pause after students answer questions so that they will know they must do the thinking, not you.
- Don't show disappointment when students give wrong answers. It discourages them from thinking.
- Be sensitive as to how many students are responding. Don't assume that if a few students answer the question, the whole class understands.







# Helping Students Read and Write Mathematics

WHY

## Rationale

There are several ways in which reading and writing mathematics are different from reading and writing in general. Pointing out these differences to students will improve their ability to learn from a textbook and to perform well on written assignments.

***There are several ways in which reading and writing mathematics are different from reading and writing in general.***

WHAT

## Main Ideas

The list of study skills shown below contains helpful suggestions for students.

HOW

## Teaching Tips

To reinforce the study skills given below:

**Talk about these skills as you teach.**

- Walk through a text lesson. Mention writing skills as you do chalkboard work.

**Have students read ahead to the next lesson.**

- Ask them to explain what they've read. Give them opportunities and incentives to read.

**Give feedback on appearance of written work.**

- Give comments on neatness. Display good work.

**Use the *Reading and Writing Mathematics* notes.**

- These are in the lesson notes in grades 3–8.

## Study Skills for Reading and Writing Mathematics

**Read everything on the page carefully.** Be aware of:

- **Math vocabulary** Note new words in bold type. Use the glossary. Watch for math words like "product" that have other meanings in everyday life.
- **Math symbols** Note that some symbols have several meanings. See the picture below.
- **Examples** Note important parts highlighted with color. Sometimes cover up the answer and try to do the problem on your own first.
- **Generalizations** These are often highlighted. Remember them to help you do the exercises.
- **Diagrams, tables, graphs** Use a ruler to help you read rows and columns. Practice interpreting drawings of solid objects.
- **Directions and word problems** Reread these more than once. Read them aloud sometimes. Try to restate them in your own words.

**Read in different directions at different times.**

- Read fractions from top to bottom. Read addition computation from right to left.

**Read with a pencil and paper nearby.**

- Try to do a problem on your own. Jot down questions. Draw pictures to help you understand.

**Read previous lessons again as needed.**

- Look up words whose meaning you've forgotten.

**Write everything on your paper neatly.**

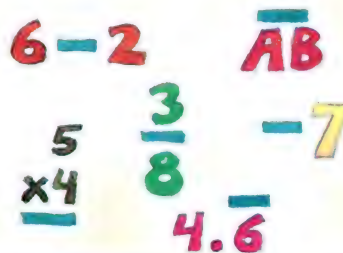
- Copy numbers and operation signs carefully. Line up digits and decimal points correctly. Make commas and decimal points visible. Don't make diagrams, tables, and graphs too small.

**Write in a way that makes your paper easy to follow.**

- Show your work next to the problem. Make the answer easy to find. Write answers to word problems in complete sentences.

**Write and then read what you write.**

- Read sentences aloud to see if they make sense. Find your mistakes on your own.



HOW YOU READ  
ME DEPENDS ON  
HOW I'M USED.



# Teaching Students with Special Needs

Gifted Students  
and High Achievers



## Rationale

Some students are able to learn mathematics easily. It should not be thought that these students—often referred to as gifted students and high achievers—do not need special attention from the teacher. It is important to help these students develop their full potential so they can eventually make the significant contributions to society that they are able to make.



## Main Ideas

Some of the characteristics of these students are given at the right.



## Teaching Tips

Here are some suggestions related to content, teaching style, and classroom management which may be helpful when working with these students.

**Omit content they already know.** Give them another assignment when the class is on a topic that these students have already mastered.

**Give special projects.** These students have initiative and can work well independently.

**Stress higher order thinking skills.** Do a lot of problem solving. Ask why things work.

**Have them tutor other students.** This will get them to do more thinking and will benefit the whole class.

**Give them challenges.** Push for mastery. Introduce new topics. Have them work with other gifted students.

**Share the big picture.** Discuss connections and relationships between ideas.

**Help them cope with being different.** They tend to be sensitive and vulnerable to peer-group rejection.

### Use the resources in *Invitation to Mathematics*

These include enrichment worksheets, enrichment suggestions in lesson notes, challenge lessons in the text, starred exercises, situational lessons, project worksheets, and special notes in front of chapters.

## Gifted Students and High Achievers

GIVE  
ME A  
CHALLENGE.



Gifted students are in the top 3%–5% of students nationally. They are students who have exceptional general intelligence and/or a specific area of strong aptitude. There are ranges of abilities, learning rates, and learning styles among gifted students. Some students are gifted in all subjects; some just in one subject or a few subjects.

High achievers are high-ability students with above-average intelligence. They have many of the same characteristics as gifted students but to varying degrees. These characteristics can make the teacher's job easier at times and harder at times. Some of these are:

**Good memory** They have good short-term and long-term memory for what they hear and read. They may get bored with repetitive drill.

---

***These characteristics can make the teacher's job easier at times and harder at times.***

---

**Long attention span** They can focus for a long time and may resist the teacher's attempts to get them to shift gears and move on.

**Knowledge and performance above grade level** Their ability to read and write is above grade level. They have a large vocabulary. They are widely informed about many topics. They may be more talkative in class.

**Capacity to do complex thinking** These students can work with symbols easily. They may take short-cuts and may not be able to explain what they did. They can understand relationships and meanings and will want to know why things work. They have curiosity and ask probing questions. They can create original or unusual products or ideas. They may get ahead of the class and be impatient.





# Teaching Students with Special Needs

Low Achievers, EMH,  
and LD Students



## Rationale

Low achievers, EMH, and LD students can do more if they're given help that meets their needs.



## Main Ideas

Some of the characteristics of these students are given at the right.



## Teaching Tips

Here are some ways to help these students.

**Present content in small steps with lots of repetition.** This will encourage retention. Post reminders to further jog the memory.

**Use a buddy system.** Have one student interpret directions for another and give help as needed.

**Avoid distractions.** Be sensitive to where the student is seated. Be sure you have the student's attention before speaking. Cover up the part of the example or page that is not being discussed.

**Help students reason.** Present something several times under several conditions, helping students to generalize from one situation to another.

**Give multisensory guidance.** Use visual cues such as color coding. Provide motor and tactile experiences such as walking on a number line, tracing numbers, and touching objects. Make oral directions simple. Pair hearing and seeing with saying, doing, and writing to meet students' needs.

---

### ***Present content in small steps with lots of repetition.***

---

**Be patient and positive.** Give immediate feedback. Provide success experiences. Avoid timed activities.

#### **Use the resources in *Invitation to Mathematics*.**

These include reteaching worksheets, reteaching suggestions in lesson notes, maintenance in the text, daily maintenance in lesson notes, suggestions for using concrete materials, pictures that develop understanding, and special notes in front of chapters.

## Low Achievers and Educable Mentally Handicapped (EMH)



Low achievers have IQs from about 75 to 90. EMH students have IQs from about 50 to 75. Both types of students have similar problems but to varying degrees.

**Memory problems** They have especially poor short-term memory.

**Short attention span** They can't concentrate for a long time.

**Slow learning rate** They can learn a lot but it takes longer. This often includes slow language development.

**Overall poor reasoning ability** They have trouble with higher order thinking skills.

## Learning Disabled

I'M CONFUSED;  
SHOW ME  
AGAIN.



These students have IQs of 100 or above. They may be fine in some subject areas but learning disabled in others.

**Memory problems** They may have poor short-term memory or poor long-term memory. They may see or hear something and remember it, then forget it, then remember it, and so on.

**Distractibility and perseveration** At times, noise, visual stimuli, or motion disturb them. At other times, they have trouble shifting from one activity to another.

**Perceptual disorders** They can see or hear something but perceive only part of it or perceive it differently (reverse digits). They may have motor perceptual problems, whereby they can't write what they see.

**Poor reasoning ability in some areas.** They may do well at some higher order thinking skills but not others. It depends on the child.



# Teaching Students with Special Needs

Student with Limited  
English Proficiency



## Rationale

Students with limited English proficiency have special needs. If these needs are met, the students will be able to realize their potential in math class.



## Main Ideas

At the right is a list of things to be aware of when teaching mathematics to a student with limited or no English proficiency.



## Teaching Tips

Here are some teaching techniques to use when you teach students with limited English proficiency.

### When you talk, use gestures and physical objects.

The student may understand the process but may not understand your directions.

**Develop concepts for math vocabulary.** Even if you translate the math vocabulary, the meaning of the translated word may not be the correct meaning. So use objects, activities, pictures, highlighting, and so on to make sure you have communicated the concept, not just the word.

**Get the students to act, write, and speak.** Don't just talk or write or act and assume the student understands. Check for understanding by eliciting a response from the student. Have students follow verbal directions. Give students oral language practice. Give students chances to demonstrate that they understand a math vocabulary term.

## Limited English Proficiency

SHOW ME  
WHAT YOU  
MEAN.



**Is this student performing at grade level with numerical skills?** Usually a student who transfers into a regular math class from a bilingual program performs well on numerical skills. Difficulties begin with word problems where language plays a part in comprehending the problem.

**Is this student participating in a second language development program?** If the student participates in an English-as-a-second-language program, his or her instruction may or may not include vocabulary specific to the content area—in this case mathematics. Words like “product” have special math meanings different from their everyday definitions. Attention should be given to the specialized math vocabulary whether the student reads at grade level or below grade level.

**Is the student participating in a bilingual education program?** First, determine if this student has received math instruction in a language other than English, and if so, what his or her math abilities are. Students who perform well in their native language will perform well in the second language, when vocabulary is no longer a barrier to understanding. Secondly, check the district policy on the use of translation to teach a new or difficult math concept. This can affect whether you or a peer tutor do any instruction in a language other than English.

**How well does the student perform in English reading?** If the student is participating in an English reading class, determine the grade level. It will be problematic for a third grader reading at the first-grade level to perform well in a third-grade math text without some special attention to the gap existing between that student's abilities in reading and mathematics.





# Relating Mathematics to Other Subjects



## Rationale

Relating mathematics to other subjects shows students that math is useful. It also makes your teaching more efficient. While you are teaching math, the students are also learning about science, health, and so on.



## Main Ideas

Relating mathematics to other subjects is fully integrated into *Invitation to Mathematics* in various ways. One way is through lesson themes. Out of 13 lesson themes in the applications strand, 6 involve other school subjects. See the picture below.

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**Relating mathematics to other subjects is fully integrated into *Invitation to Mathematics* in various ways.**

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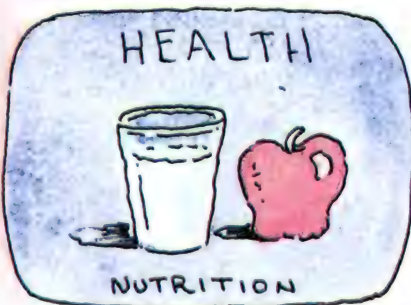
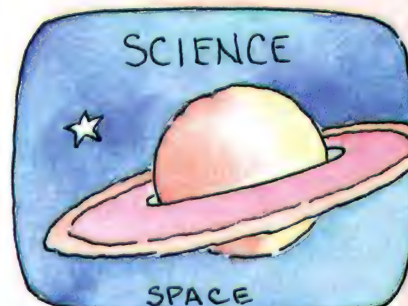
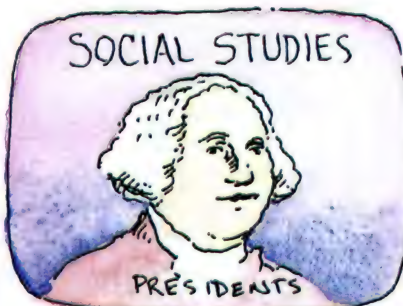


## Teaching Tips

Point out mathematical ideas that appear when you teach other subjects. And when you're teaching math, use these features of *Invitation to Mathematics*:

- **Lesson themes** These are labeled in lesson notes and in front of chapters. Some themes carry over two or more lessons.
- **Motivational situations** These and other lesson notes under *Introduction* in grades 3–8 suggest questions related to the theme of the lesson.
- **Situational lessons** These lessons in grades 3–8 often relate math to other school subjects.
- **Follow-up notes** Many of the lesson notes suggest additional work related to the lesson theme.
- **Extra reinforcement of reading** The stories in grades K–2 help to develop students' oral language base. And there are specially flagged lesson notes in grades 3–8 called *Reading and Writing Mathematics*.

## Math and...





# A Seven-Step Lesson Plan

WHY

## Rationale

Some teachers like to use a general lesson plan to help structure the way they present the lesson.

WHAT

## Main Ideas

The seven-step plan shown at the right is one that many teachers have found useful.

HOW

## Teaching Tips

Here are some suggestions for each step.

**1 Anticipatory set** Review the main idea of yesterday's lesson, or describe a situation that motivates the lesson. In grades 3–8, you might use the *Warm-Up Review* suggestions or the *Motivational Situation* or the introductory problem in the text.

**2 Objective** Use the lesson title or the objective.

**3 Instructional input** Use the suggestions under *Introduction* and *Using the Pages* including the suggestions for using concrete materials.

**4 Modeling** Walk through an example. Use the examples on the page as well as any *Other Teaching Examples* provided in the lesson notes.

**5 Check for understanding** Here are 3 ways to check for understanding:

- **Sampling** Ask questions of the whole class. Get answers from representative students.
- **Signaling** Have each student respond by signaling thumbs up (agree), thumbs down (disagree), or thumbs to the side (not sure).
- **Individual private response** Have each student write or whisper the answer to the teacher.

**6 Guided practice** Have students do one or more problems on their own. In grades 3–8, use the *Try* exercises. Use the *Error Analysis* notes to correct errors before they get practiced.

**7 Independent practice** Give the assignment. Use the assignment guide in grades 3–8. Note the *More Practice* at the back of the text.

### 1 Anticipatory set

Motivate students to focus on what they're about to learn.

SUPPOSE YOU HAD...



### 2 Objective

Tell students what they'll be able to do by the end of the class period.

TODAY YOU'LL LEARN...



### 3 Instructional Input

Determine what information students need to accomplish the objective; communicate that information

LET'S START WITH...



### 4 Modeling

Demonstrate the task, thinking aloud as you go step by step.

WATCH WHILE I DO AN EXAMPLE.



### 5 Checking for understanding

Get a quick check on students' understanding.

WHY IS THIS...



### 6 Guided practice

Have students do the task while you monitor what they're doing. Give help as needed.

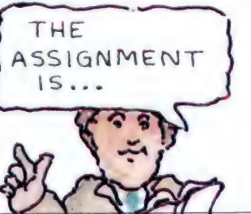
TRY TO DO THIS ONE YOURSELF.



### 7 Independent practice

Have students practice the skill with little or no teacher direction.

THE ASSIGNMENT IS...







# Using Situational Lessons

WHY

## Rationale

A situational lesson is a problem-solving project that students work on for two or more days. Students help formulate the problem and work together to explore solutions. So they gain a sense of involvement.

WHAT

## Main Ideas

Some characteristics of a situational lesson are:

**Complex, open-ended problem** A broad problem is posed that students can take in different directions.

**High interest** The situation is challenging—related to students' lives or to an interesting fantasy.

**Problem formulation** Students make assumptions and formulate questions.

**Data collection** The situation may lead students to collect data in school or outside of school.

**Development and reinforcement of math content** The lesson can be a springboard for new content (needed to solve the problem) or reinforcement of old content.

**Unification of concepts** Various strands are involved. So students see math in an integrated way.

**Variety of approaches** Students explore ways to solve the problem. They aren't told one way by the teacher.

**Decision making** Students make choices along the way and exercise higher order thinking skills.

**Small group work** The lessons are ideal for this.

HOW

## Teaching Tips

Here are some sources of situational lessons.

**Math stories** In grades K–2, seeing characters in the stories deal with situations is readiness for the *Situational Lessons* presented in grades 3–8.

### Situational lessons at the beginning of chapters

In grades 3–8, these lessons relate to the picture on the page or to a math poster. You can spend 2–3 days on a lesson or spend some time at first and come back to it later in the chapter. The lesson typically involves content covered in the chapter. Pose the basic situation and let the students come up with possible problems. Let the lesson belong to the students. That's the secret to success.

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***Pose the basic situation and let students come up with the possible problems. Let the lesson belong to the students. That's the secret to success.***

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### Motivational situations at the beginning of lessons

In grades 3–8, these are suggested in some of the lesson notes. Students are asked to identify things one would consider in a given situation. This reinforces problem formulation. You could have the students make up a broad problem about that situation and solve it over several days.

**Lesson themes** When 2–3 lessons are on the same theme, you can have students formulate a problem on that theme and solve it over 2–3 days.

**Project worksheets** Some of these worksheets in grades 1–8 can be used as situational lessons.

PLAN A TRIP.



HOW PEOPLE KEEP TRACK OF TIME



HOW NUTRITIOUS IS THE FOOD YOU EAT?



FIND THE LEAST POSSIBLE WEIGHT FOR \$625.00 in coins.





# Evaluating Problem-Solving Performance



## Rationale

It's important to do a careful job of evaluating problem-solving performance because many factors are involved, including a student's reading ability. And since solving problems is not a rote procedure, it is harder to diagnose errors.



## Main Ideas

When you test problem solving, evaluate performance on a variety of problems. Use a variety of formats (written tests, oral tests, activities) for presentation of problems and for student responses. Evaluate students' attitudes as they try to solve problems.



## Teaching Tips

*Invitation to Mathematics* offers a variety of resources for evaluating problem-solving performance.

**Written tests** Chapter and cumulative tests in free-response and multiple-choice format are available. They test various types of problems from simple to nonroutine. They focus on various aspects of the problem-solving process. For example, they include problems with too much or too little information. They require students to get data from pictures (tables, and so on), write problems, select strategies, tell the correct operation, interpret remainders, and choose sensible answers.

**Oral tests** You can select a problem from a written test and read it aloud or add oral problems to a test. For daily evaluation of problem solving in class discussions and for formal tests, often have students give verbal explanations of how they got the answer.

**Testing through activities** This is especially important in grades K–2 where students' reading ability is limited. Lesson notes for grade K–2 tests suggest activities for testing problem solving.

**Testing open-ended problem-solving situations** You can do this using the *Situational Lessons* at the beginning of chapters in grades 3–8. Look for the indicators of success described in the lesson notes.

## Point system for evaluating problem-solving work

Sometimes use the point system shown below for evaluating homework, written tests, oral explanations, and responses given on the Problem-Solving Worksheet (shown on the next page).

**Evaluating problem-solving attitudes** As you observe students solving problems, give positive feedback for attitudes like the ones listed below. If you wish to record your observations, put a numerical rating or just a check in the appropriate boxes.

### Evaluating Problem-Solving Work

#### Points

- 0 Shows no understanding of the problem.
- 1 Partially understands the problem. No solution attempt or inappropriate attempt.
- 2 Understands the problem. No solution attempt or inappropriate attempt.
- 3 Partially understands the problem. Appropriate plan for the part of the problem that was understood correctly.
- 4 Understands the problem. Appropriate plan but made a careless error in copying, computing, or labeling the answer.
- 5 Correct answer. Solution clearly shown.

### Evaluating Problem-Solving Attitudes

- ☐ Perseverance and patience
- ☐ Willingness to take risks and play hunches
- ☐ Willingness to try alternative approaches
- ☐ Willingness to try problems on their own
- ☐ Ability to work in a systematic manner
- ☐ Self-confidence

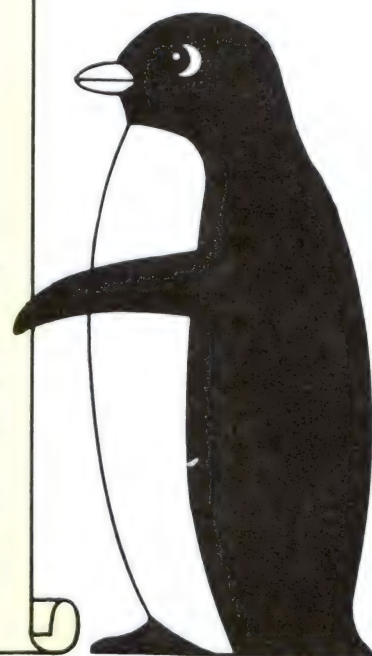




**Problem-solving worksheet** You can use the problem-solving worksheet shown below in 3 ways:

- **To provide guiding questions in written form** when students need help. These questions are similar to those on the Problem-Solving Questioning Guide shown earlier. Eventually students will learn to ask themselves these questions and will become more independent problem solvers.
- **To test problem-solving process** when you want to give partial credit for solution attempts and you want to provide a place for students to record their work systematically.
- **To diagnose errors** when students are having trouble and you want a helpful way to spot where they are making mistakes.

| Name _____ |                          | Problem-Solving Worksheet                                  |  |
|------------|--------------------------|--|--|
| READ       | Understand the question  | What are you asked to find? _____                          |  |
|            | Identify needed data     | What facts are given? _____                                |  |
|            |                          | Circle any facts that are not needed to solve the problem. |  |
| PLAN       | Analyze the action       | Is computation needed? If yes, what operation(s)? _____    |  |
|            | Select strategies        | Will other strategies help? Which ones? _____              |  |
| SOLVE      | Carry out the plan       | Give an estimate of the answer. _____                      |  |
|            |                          | Find the answer. Show your work here.                      |  |
|            | Try again, if needed     |  |  |
| ANSWER     | Give a complete answer   | Give the answer in a complete sentence. _____              |  |
| LOOK BACK  | Check for reasonableness | Did you answer the question? _____                         |  |
|            |                          | Did you use all needed data? _____                         |  |
|            |                          | Does your answer make sense? _____                         |  |
|            | Check your computation   | Is the answer close to your estimate? _____                |  |
|            |                          | Did you compute correctly? _____                           |  |





# Alternative Strategies for Evaluation



## Rationale

Traditional free-response and multiple-choice tests have some limitations. They are better for testing rote skills than for testing higher order thinking skills. They tend to focus more on the answer than on how the answer was obtained. They involve reading and writing mathematics but not hearing, speaking, observing, or demonstrating. They may overemphasize performance on the day of the test. And they don't assess students' attitudes. So it makes sense to supplement a testing program with alternative strategies for evaluation.

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**Traditional free-response and multiple-choice tests have some limitations.**

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## Main Ideas

Some alternative ways to evaluate are:

**Class discussion** You can assign a grade or give points for a student's participation in class throughout the grading period or just on certain days. Evaluate the students' thinking as well as their attitude. An observation form for evaluating problem-solving attitudes is suggested on the previous two pages.

**Oral tests** Sometimes read test items aloud. Sometimes have students respond orally, so that they have a chance to explain their thinking in their own words.

**Written explanations** Asking students to give a written explanation can help them clarify their thinking. The Problem-Solving Worksheet shown on the previous page generates a partially structured written explanation. Also, note the point system for evaluating problem-solving work.

**Testing through activities** Sometimes present the test items using objects and have the students use objects to give the answers. At grades K–2, the lesson notes for the tests suggest ways to test each objective using an activity.



## Teaching Tips

**Consider a student's needs when selecting a type of evaluation.** Some students learn better by observing and hearing, than by reading. Some communicate better by speaking and demonstrating, than by writing. It is particularly important in the lower grades not to assess a student's math ability only with written tests.

**Consider the content when selecting a type of evaluation.** For basic facts, you may want to give an oral test, perhaps a timed test. For problem solving, you might want to have students think out loud while solving the problem. For place value or measurement or geometry, working with objects can have many advantages over a written test.



Use alternative strategies for evaluation to enhance your testing program.





## Rationale

Students sometimes do not perform as well on standardized tests as they do on teacher-made tests or textbook tests. There may be several reasons for this related to the format and content of the tests. Discussing these with students ahead of time can better prepare them for the standardized test.



## Main Ideas

Here are some ways in which standardized tests may be different from other tests students have taken.

**Format** Students may have limited experience with multiple-choice tests. For some questions, such tests are harder because having options may confuse the student. Students may not have much experience marking a separate answer sheet. Note that an answer sheet for the multiple-choice tests in *Invitation to Mathematics* is included in the Teacher's Resource File.

**Content** A standardized test may cover a broader range of content than you have covered, if you have not been able to go through the course at a typical pace. The relative emphasis given to various strands may be different than the emphasis you have given in class. Some standardized tests may be longer than tests students have had. Some of the questions may be trying to assess general aptitude or thinking skills and not a specific piece of math content. It's important not to let these differences between standardized tests and other tests shake your students' confidence.



## Teaching Tips

Some hints for taking standardized tests are shown below. You might share these with your students.

### How to Do Your Best on a Standardized Test



#### Hard questions

- Don't get bogged down by hard questions. Move on and answer questions which you can do quickly. Come back to the hard ones later. They may seem easier to you the second time you see them.

#### Unfamiliar questions

- Don't panic if you come to a question on a topic you've never seen before. If you can't figure it out, move on and come back to it later.

#### A long test

- Try to pace yourself so that you see all the questions. There may be easy ones at the end.

#### Selecting an answer

- For hard questions, read all the choices before answering. Sometimes you can find the correct choice by eliminating ones you know are incorrect.

#### Marking the answer sheet

- Be sure you understand how to mark it. You will probably have to fill in circles or rectangles on a sheet of paper or on a card.
- It's easy to begin marking answers in the wrong places. Check periodically to be sure the answer number and the question number correspond. When you mark an answer, take another second to be sure it's the one you intended to mark.

#### Guessing

- Some tests penalize for guessing. They subtract a percentage of the wrong answers from your score. But if you can eliminate a couple of the incorrect choices, it is still a good idea to guess.

#### Relax

- Don't think about how well you're doing. Think about what you're doing. Don't let things throw you.



# Encouraging Home Involvement



## Rationale

School learning is enhanced when there is support from the home. This support can be fostered by encouraging home involvement.



## Main Ideas

To encourage home involvement, you might send home:

**Reports of student's progress** These might be more detailed or more frequent than report cards.

**Information about what the student is studying** This might be general information about areas of emphasis or information about specific chapters.

**Math activities for students to do with others** These encourage students to discuss math with others and possibly get some extra help from them.

**Requests for specific kinds of support** One example of this might be support for certain expectations concerning homework.



## Teaching Tips

*Invitation to Mathematics* offers a variety of resources for encouraging home involvement.

**Record forms** The Student Test Record Form or the Form for Individualizing can be sent home, if you wish. These are in the Teacher's Resource File.

**Letters home** A letter to go home at the end of each chapter is found in the Teacher's Resource File. It includes information about the content of that chapter, math activities for that chapter which students can do with others, and a preview of the next chapter. You might also send home information about some general areas of emphasis as shown below.

**Homework to do with others** In grades 3–8, the lesson notes include specially flagged suggestions for math problems and activities that students can do with others outside of school.

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***A letter to go home at the end of each chapter is found in the Teacher's Resource File.***

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### *A note about problem solving*

One area of emphasis this year in math class is problem solving because students need to learn how to use their math skills. A rich variety of problems and problem-solving strategies will be taught. You might point out ways that you or other people use mathematics. Thank you for your support.



### *A note about estimation and mental math*

Two areas of emphasis this year in math class are estimation and mental math. Estimation helps students give sensible answers. And mental math helps them do simple exercises quickly. You might discuss how you would estimate  $\$2.98 + \$4.11 + \$2.03$  or find  $3 \times \$0.99$  in your head. Thank you for your support.



### *A note about calculators*

This year in math class, some work with calculators will be done to teach math concepts and to help with problem solving. This will not interfere with memorizing facts like  $9 + 7$  or with paper-and-pencil skills. You might discuss ways in which you or others use calculators. Thank you for your support.





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# Cooperative Learning Groups

Introduction

WHY

## Rationale

Cooperative learning activities give students a chance to work and learn together. Cooperative learning can result in:

- **Better achievement** because students verbalize their thoughts and help each other.
- **Positive attitudes** because students gain more confidence in their ability to learn.
- **Good career preparation** because students learn to cooperate and work as a team.

**Cooperative learning group activities give students a chance to work and learn together.**

HOW

## Teaching Tips

The next 3 pages explain the following 7-step plan for a cooperative learning activity. The pages after that describe 2 cooperative learning activities for each chapter. Each activity uses these 7 steps.

### Steps in a Cooperative Learning Activity

#### Teacher Presentation

- Step 1 Have students move to study groups.
- Step 2 Discuss skills for learning together.
- Step 3 Introduce the lesson.

#### Group Work

- Step 4 Assign roles.
- Step 5 Describe group task.

#### Evaluation

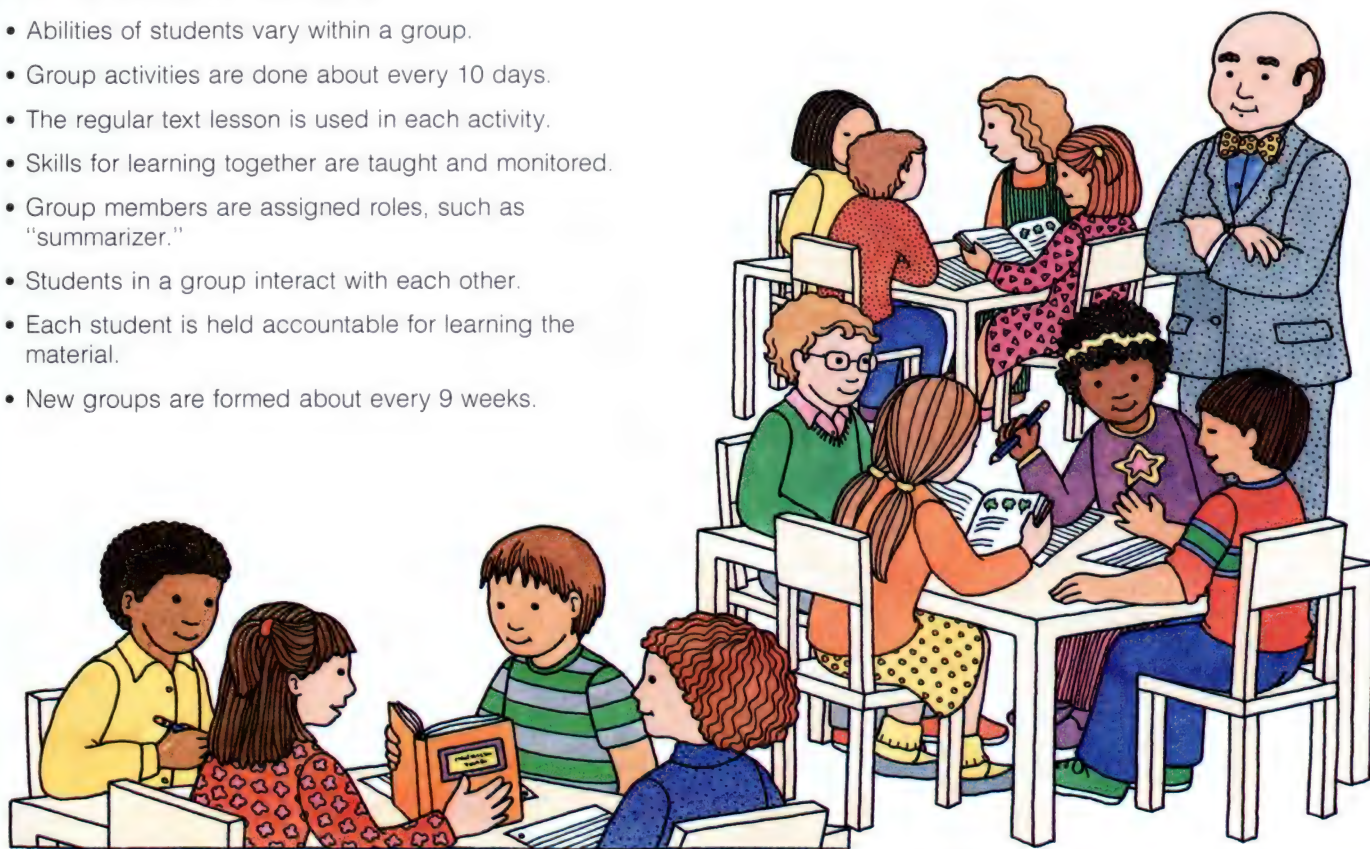
- Step 6 Monitor skills for learning together.
- Step 7 Check for individual understanding.

WHAT

## Main Ideas

Here are the main characteristics of the cooperative learning activities in *Invitation to Mathematics*.

- There are 4 students per group.
- Abilities of students vary within a group.
- Group activities are done about every 10 days.
- The regular text lesson is used in each activity.
- Skills for learning together are taught and monitored.
- Group members are assigned roles, such as "summarizer."
- Students in a group interact with each other.
- Each student is held accountable for learning the material.
- New groups are formed about every 9 weeks.





If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

### Step 1

#### Have students move to study groups.

Here are some guidelines for forming study groups.

#### The teacher decides who is in which group.

Students should not select their own groups.

#### There are 4 students in each group.

Extra students can be math captains. Math captains help all groups by answering questions and circulating among the groups to check selected answers.

#### Abilities of students vary within a group.

Typically a group contains 1 above-average student, 2 average students, and 1 less-able student.

#### Each member of a group is assigned a letter.

The 4 group members are called T, E, A, and M. The T's are above average, E's and A's are average, and M's are less able. Group members will be assigned roles in step 4. The role assignments vary from one activity to another.

#### Group members sit where they can face each other.

Working around one desk or table is best.

#### Students stay in the same group for 9 weeks.

This forces members of the group to cooperate.

### Step 2

#### Discuss skills for learning together.

Students do not automatically know how to work well in groups. So a specific skill for learning together is discussed in each activity. Tell students they will be evaluated on how well they use this skill (step 6).

#### Skills for Learning Together

##### Thinking Aloud

Students explain each step as they work. This clarifies their thinking and also helps others.

##### Settling Disagreements Without Voting

Instead of letting the majority rule, students should help each other understand.

##### Locating and Analyzing Errors

Students point out each other's mistakes and explain how they were made.

##### Asking Leading Questions

One student does this to help another get started.

##### Explaining with Pictures or Objects

This helps a student who has trouble visualizing. Either that student or the person giving help might do the explaining.

### Step 3

#### Introduce the lesson.

Use a regular text lesson, and introduce the lesson as you normally would on any other day. Sometimes you might model cooperative learning skills. For example, you might "think aloud" or "ask leading questions."

### Step 4

#### Assign roles.

One or two specific roles are usually assigned in an activity. For example, in one activity, T's might be checkers and M's might be summarizers. In another activity, T's and A's might be encouragers.

#### Roles Assigned to Students

##### Reader

This student reads aloud while others follow along silently.

##### Encourager

This student encourages other members of the group to participate and to use the skill for learning together.

##### Summarizer

A summarizer is told a specific time to verbalize how to solve a problem. When a student summarizes, others should listen carefully.

##### Checker

A checker may be directed to ask group members for answers or to ask others if they agree. Checkers may go to a correcting station to check the group's answers.

##### Materials Manager

This student gets any materials that are needed and returns them at the end of the period.

### Step 5

#### Describe group task.

A variety of strategies are used during the group work period. For example, early in the year, the groups are often divided into 2 pairs. For the skill activities in Chapters 7–12 of grades 3–8, a strategy called "challenge match" is used. Challenge match rules are given after the description of step 7. For all activities, emphasize the group's responsibility to make sure all group members learn the material. Remind students there will be a check for understanding at the end of the period (step 7).



# Cooperative Learning Groups

Introduction

## Step 6

### Monitor skills for learning together.

In step 2, a skill for learning together was discussed. Now in step 6, students are evaluated on how well they used that skill. Five techniques are described below. The last three are used only in grades 1–6.

#### Techniques for Evaluating Student Use of Skills for Learning Together

##### 1-to-5 Scale

With 1 meaning "poor" and 5 meaning "excellent," the teacher rates the class on how well they demonstrated the desired behavior. Or individual students can rate their own group's performance.

##### Teacher Feedback

The feedback should be clear and specific. The teacher should focus on the group or class by citing examples of positive behavior without mentioning individual students.

##### Mystery Person

At the beginning of the period, the names of all students are put in a container. The teacher draws a name but does not tell it to the class. During the group work, the teacher observes this mystery person to see if he or she practices the specific skill for learning together. If the mystery person does well, the whole class gets a reward and the person's name is announced. Otherwise, the person's name is not announced, and the person is talked to privately.

##### Mystery Group

A slip of paper for each group is put in a container. One slip is drawn by the teacher, but the identity of the group is not announced. The teacher watches this group to see if the group uses the skill for learning together. If the group does well, the whole class gets a reward and the identity of the group is announced. Otherwise, without identifying the group, the teacher specifically tells what skills were not demonstrated by the mystery group.

##### Silent Voting

Students close their eyes and think about the behavior they are going to rate. Then they signal thumbs up (good), thumbs down (poor), or thumbs to the side (O.K.) to indicate their rating. The teacher then comments on the ratings.

## Step 7

### Check for individual understanding.

All students should be accountable for learning the material. To achieve this, the evaluation techniques described below are used. In grades 3–8, challenge match, which is described on the next page, is also used.

#### Techniques for Checking for Individual Understanding of the Mathematics Content

##### Class Goal

All students do a group of exercises. The teacher sets some kind of class goal. For example, if 30 students each do 5 exercises for a total of 150 answers, the goal might be 120 correct answers. If the goal is met, everyone in the class gets a reward (perhaps bonus points in the grade book).

##### Group Goal

This is similar to the class goal but applies to each group.

##### Draw-a-Name Challenge

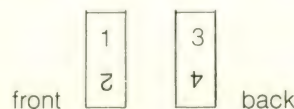
Each student's name is written on a slip of paper. All students do an exercise, and 3 or more names are drawn. A goal of so many correct answers is set. The teacher announces how many exercises these students did correctly. The teacher does not tell how each student did individually.

##### No-Name Challenge

Students do one or more exercises at the beginning of the period, without writing names on their papers. The papers are collected and corrected by a student helper. At the end of the period, the students work a similar set of exercises. These are collected and corrected. The goal is for the class to get more right than they did at the beginning of the period.

##### Signaled Response

One student gives the answer to a problem, and the teacher calls for a short silence period. Then other students in a group or in the class signal agreement (thumbs up), disagreement (thumbs down), or "not sure" (thumbs to the side). Another way to signal is with 3 x 5 cards. The numbers 1 through 4 are written on a card for each student as shown below. Four answers are written on the board and numbered 1 through 4. Each student holds up the number which signifies the correct answer.





If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

## Challenge Match

Challenge matches are used in grades 3–8 with the skill activities for Chapters 7–12. Challenge matches combine cooperation and competition. Preparation for challenge matches is a group task (as in step 5). The actual challenge match provides a check for individual understanding (as in step 7).

### Brief overview of Challenge Match

Students prepare for challenge matches in their regular study groups. Then they change seats so that T's can compete against T's, E's against E's, and so on. Students do exercises, and other students have a chance to challenge the answers. If a challenger is correct, that person gets a card. If not, the person who gave the correct answer gets a card. After the challenge matches, students return to their regular groups and count cards. The group with the most cards wins.

### Detailed instructions for Challenge Match

#### 1. The teacher selects a study group to be "directors."

The T in this group will direct a match in which T's compete, the E will direct a match among E's, and so on.

#### 2. The directors prepare "1-to-50 lists."

Each director gets an assignment from the teacher and circles the exercise numbers on the list (see right). The director also copies answers for the exercises onto another 1-to-50 list.

#### 3. Students go to their study groups to prepare for the matches.

The teacher assigns a practice set of exercises. Each group decides how to use these to prepare for the match. Group members might all do an exercise and then compare answers. They might each do one aloud while others listen. They might do several and then help the students who seem to be having difficulty.

#### 4. Students move into their seats for the challenge matches.

The T's sit together, E's sit together, and so on.

#### 5. A student within each group selects an exercise.

The director crosses off that number on the list. This begins the first round of the match.

Challenge Match  
for the  
T's

More  
Practice  
Set 98  
Page 387  
Other:

|              |    |
|--------------|----|
| 1            | 26 |
| 2            | 27 |
| 3            | 28 |
| 4            | 29 |
| 5            | 30 |
| <del>6</del> | 31 |
| 7            | 32 |
| 8            | 33 |
| 9            | 34 |
| 10           | 35 |
| 11           | 36 |
| 12           | 37 |
| 13           | 38 |

|    |    |
|----|----|
| 24 | 49 |
| 25 | 50 |

#### 6. The exercise is read aloud and written down.

The director reads the exercise aloud, writes it on a 3 × 5 card, and gives the card to the person who selected the exercise. The other students also write down the exercise.

#### 7. Answers are obtained.

Everyone does the exercise. Then the person who chose the exercise says the answer aloud.

#### 8. Students have a chance to challenge.

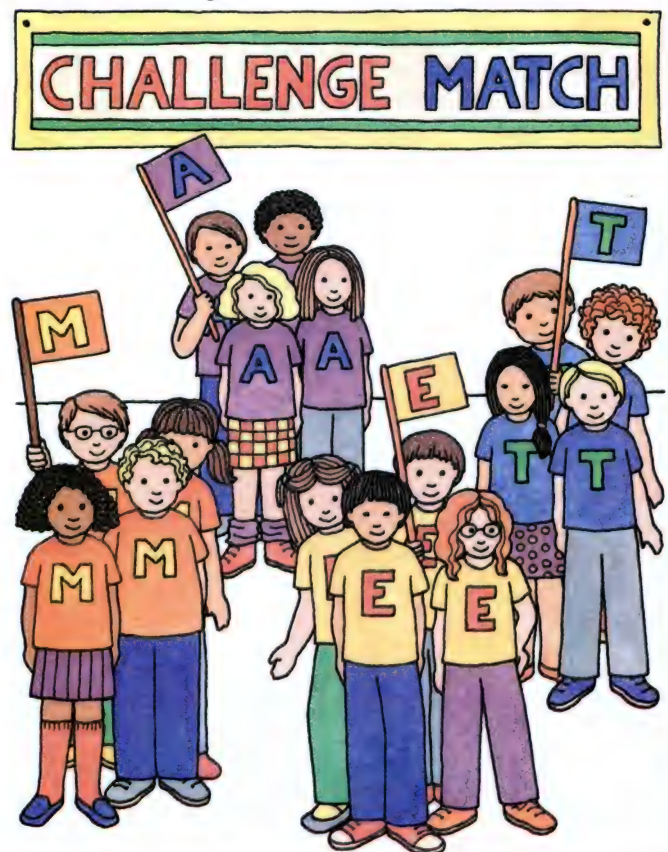
In clockwise order, the other students either agree or challenge the answer. If a challenger is correct, that person gets the 3 × 5 card. If the challenger is wrong, the challenger must give a card (if he or she has any) to the director. If no one challenges, the director checks the first person's answer. If that answer is correct, that person keeps the card. If that answer is wrong, the director keeps the card and there is no penalty (that person need not return a card).

#### 9. The next round begins.

The next student looks at the 1-to-50 list and selects an exercise that has not been crossed out. When time is called, allow students to complete a round so that all players at a given table have the same number of turns.

#### 10. The winning group is determined.

When time is called, students return to their original study groups and count cards. The group with the most cards wins the challenge match.





# Cooperative Learning Groups

Activities  
for Chapter 1

## Skill Activity

(Use with pages 8–9.)

### Teacher Presentation (about 15 minutes)

1. Have students move to study groups (p. 471)  
Form the study groups that will be together for Chapters 1–3.
2. Discuss skills for learning together (p. 471)  
Discuss how “explaining with pictures or objects” can help a student who is having trouble. In this activity, students will use counters to show subtraction facts.
3. Introduce the lesson (p. 471)  
“Subtraction Basic Facts,” pages 8–9

### Group Work (about 20 minutes)

4. Assign roles (p. 471)  
A's are materials managers. Besides taking their book, paper, and pencil, they also need a set of at least 20 counters.
- M's are checkers. They make sure all group members can demonstrate how to use counters to show the subtraction exercises.
5. Describe group task (p. 471)  
Tell the groups they will have approximately 5 minutes to make sure everyone in their group can use counters to show how to do Exercises 1–21, page 9. Discuss possible ways the M's could check everyone.

### Evaluation (about 5 minutes)

6. Monitor skills for learning together (p. 472)  
Provide “teacher feedback” on how well the groups did at using counters to show subtraction basic facts.
7. Check for individual understanding (p. 472)  
Use the “draw-a-name challenge” technique with one of the 21 exercises on page 9 that were done in step 5.

## Problem-Solving Activity

(Use with pages 16–17.)

### Teacher Presentation (about 15 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 1–3.
2. Discuss skills for learning together  
Stress that today students should make sure the groups “settle disagreements without voting.” Group members should try to understand which answer is right and why.
3. Introduce the lesson  
“Problem Solving: Choose the Operation,” pages 16–17

### Group Work (about 15 minutes)

4. Assign roles  
T's are materials managers. They make sure their group has a set of at least 20 counters.
5. Describe group task  
Read Problem 1 on page 17. After reading the problem, call for a 30-second silence period during which each student will decide whether he or she should add or subtract to solve the problem. After the silence period, have the A's tell their groups whether they would add or subtract. Other group members signal thumbs up or thumbs down to indicate agreement or disagreement. Each group should reach a consensus among their members. Point out the importance of not voting to settle disagreements.

Work through Problems 3–10 in the same fashion. In each case, read the problem, call for a 30-second silence period, and then designate someone in each group (T's, E's, etc.) to explain how they plan to solve the problem.

If time remains, go through the problems a second time and have the students give the answers.

### Evaluation (about 10 minutes)

6. Monitor skills for learning together  
Provide “teacher feedback” on whether the students remembered to settle disagreements without voting.
7. Check for individual understanding  
Use the “draw-a-name challenge” technique with Problems 1–6 in More Practice Set 7, page 354.







If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

### Skill Activity

(Use with pages 32–33.)

#### Teacher Presentation (about 15 minutes)

##### 1. Have students move to study groups

Keep the same study groups together for Chapters 1–3.

##### 2. Discuss skills for learning together

Explain that students should help others “locate and analyze errors.” They should never let a group member think his or her error is due to bad luck or an inability in math.

##### 3. Introduce the lesson

“Ordering Numbers,” pages 32–33

#### Group Work (about 15 minutes)

##### 4. Assign roles

A's are checkers.

##### 5. Describe group task

Have all students do Exercise 1 on page 33. After an adequate amount of time has passed, draw a student's name and ask the student to give the answer. Record the student's answer on the overhead or on the chalkboard. Ask the rest of the students to signal thumbs up or thumbs down to show whether or not they agree. If everyone agrees, compliment the class. If some students disagree, show how to check the answer by first looking to see if the hundreds are in the correct order, then the tens, and then the ones. When the correct answer has been determined, tell the class they will have 3 to 4 minutes in their study groups. During this time, the A's should make sure all group members can order the numbers in Exercises 1 through 10 from least to greatest.

If time permits, have groups practice ordering numbers from greatest to least with Exercises 11–20, page 33.

#### Evaluation (about 10 minutes)

##### 6. Monitor skills for learning together

Provide “teacher feedback” on whether students helped others locate and analyze errors.

##### 7. Check for individual understanding

Use the “draw-a-name challenge” technique with Exercises 1–6 in More Practice Set 13, page 356.

### Problem-Solving Activity

(Use with pages 40–41.)

#### Teacher Presentation (about 15 minutes)

##### 1. Have students move to study groups

Keep the same study groups together for Chapters 1–3.

##### 2. Discuss skills for learning together

Discuss how to help someone who is stuck by “asking leading questions” instead of telling answers.

##### 3. Introduce the lesson

“Problem Solving: Use a Table,” pages 40–41

#### Group Work (about 15 minutes)

##### 4. Assign roles

E's and A's are encouragers.

M's are readers.

##### 5. Describe group task

Have the groups do Problems 1–9, page 41, one at a time, as follows: First have the M's read Problem 1. Then have the T's tell whether you should round off a number or compare several numbers. Once the group members agree on the answer, have each student in the group solve the problem individually. If a student needs help, the encouragers suggest that someone ask leading questions to help. Each group should reach a consensus on the answer. Taking turns answering, the groups should then proceed to do the rest of the problems in the same manner.

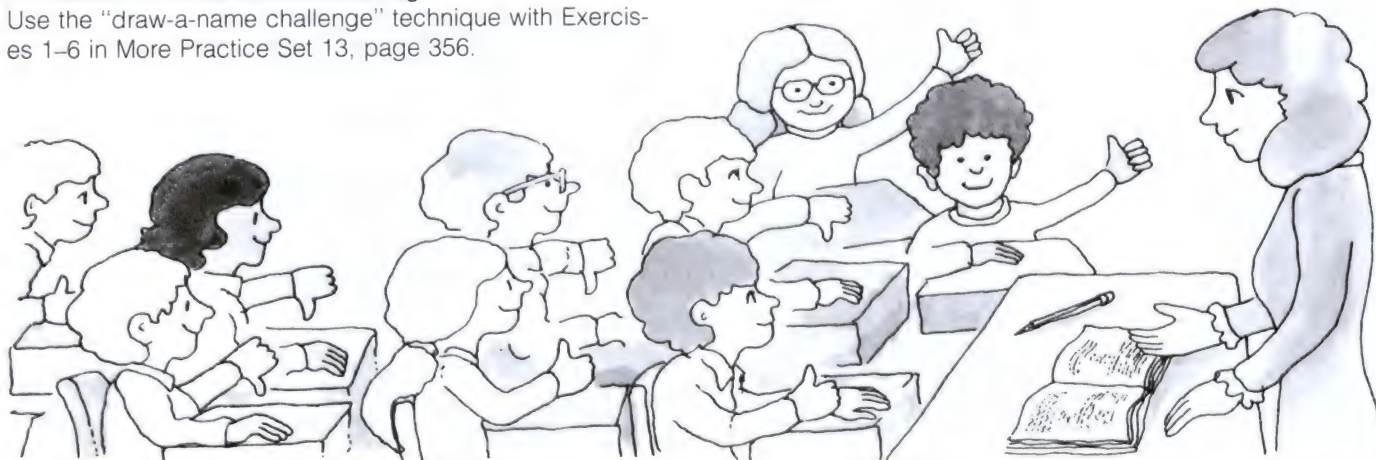
#### Evaluation (about 10 minutes)

##### 6. Monitor skills for learning together

Use “teacher feedback” to evaluate how well students remembered to ask leading questions to help those who didn't understand.

##### 7. Check for individual understanding

After reviewing the table in More Practice Set 16, page 357, have all students work Problems 1 and 2 individually. Set a “class goal” of getting so many right.





# Cooperative Learning Groups

Activities  
for Chapter 3

## Skill Activity

(Use with pages 64–65.)

### Teacher Presentation (about 10 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 1–3.

### 2. Discuss skills for learning together

Discuss how students should help each other learn by "thinking aloud."

### 3. Introduce the lesson

"Estimating Differences," pages 64–65

### Group Work (about 15 minutes)

#### 4. Assign roles

A's are encouragers.

#### 5. Describe group task

Have students take turns doing Exercises 1–24, page 65. The A's should encourage each person to think aloud so that everyone can see how the estimate was made.

### Evaluation (about 15 minutes)

#### 6. Monitor skills for learning together

Have groups use the "1-to-5 scale" to rate whether they did a good job of thinking aloud.

#### 7. Check for individual understanding

Have students individually work Exercises 1, 7, 13, 18, 23, and 27 in More Practice Set 25, page 360. Set a "class goal" of a certain number of groups getting so many right.

THINK ALOUD!



## Problem-Solving Activity

(Use with pages 82–83.)

### Teacher Presentation (about 15 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 1–3.

### 2. Discuss skills for learning together

Review the method of "asking leading questions" when a student is having trouble.

### 3. Introduce the lesson

"Problem Solving: Write an Equation," pages 82–83

After page 82 has been discussed, give each student a slip of paper. Tell students they are to work Problem 1, page 83, as best they can by themselves. On the slip of paper, they should write the equation along with the answer to the problem. They are *not* to write their names on the paper. These papers should be collected immediately and corrected during the group work period. The number right will be used later in setting a class goal for the "no-name challenge" in step 7.

### Group Work (about 15 minutes)

#### 4. Assign roles

E's *read* the problem.

T's *plan* by writing an equation.

A's *solve* the equation and state the *answer*.

M's *look back* and determine whether the answer is reasonable.

#### 5. Describe group task

Have group members perform the tasks given above. Each group member will carry out one of these steps in each problem.

Demonstrate this process using Problems a and b in the "Try" section as examples. Select one group and have the appropriate members demonstrate each step. Emphasize that if a student has trouble, the other group members should help by asking leading questions, not by telling the answers. Have the groups follow this procedure with Problems 1–8, page 83.

### Evaluation (about 10 minutes)

#### 6. Monitor skills for learning together

Provide "teacher feedback" on whether the students asked leading questions instead of telling the answers.

#### 7. Check for individual understanding

Use the "no-name challenge" technique. Have the students individually work Problem 1 in More Practice Set 32, page 363. Compare the total number right to that achieved by the class in step 3.





If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

**Skill Activity**

(Use with pages 94–95.)

**Teacher Presentation** (about 10 minutes)

## 1. Have students move to study groups

Form new study groups for Chapters 4–6.

## 2. Discuss skills for learning together

Discuss "settling disagreements without voting" as a way for students to make better estimates as a group than they can make individually.

## 3. Introduce the lesson

"Centimeter and Decimeter," pages 94–95

**Group Work** (about 15 minutes)

## 4. Assign roles

M's are encouragers.

## 5. Describe group task

Have the groups work Exercises 1–14, page 95. Answers are obtained from a correcting station. The E's get the answers to Exercises 1–4 while the T's, A's, and M's work these exercises individually. Have the T's, A's, and M's agree on the answer and then check with the E's to see if they are right. The other 2 sections are done in the same way except the T's get the answers for Exercises 5–10, and the A's get the answers for Exercises 11–14. In each case, the M's should encourage group members to settle disagreements without voting.

**Evaluation** (about 15 minutes)

## 6. Monitor skills for learning together

Use the "mystery group" technique to evaluate whether students settled disagreements without voting.

## 7. Check for individual understanding

Have students individually work Exercises 1–9 in More Practice Set 35, page 364. Using a "class goal," challenge the class to have a certain number of groups get a total of 30 right.

**Problem-Solving Activity**

(Use with pages 104–105.)

**Teacher Presentation** (about 15 minutes)

## 1. Have students move to study groups

Keep the same study groups together for Chapters 4–6.

## 2. Discuss skills for learning together

Discuss how to "ask leading questions" when a student needs help.

## 3. Introduce the lesson

"Problem Solving: Use Estimation," pages 104–105

Show students how to ask leading questions. For example, suppose a student is having difficulty with Problems a and b in the "Try" section. Possible leading questions for Problem a include:

"What 2 distances are involved?"

"What is the question asking?"

"What part of the quicksand do you measure from?"

**Group Work** (about 15 minutes)

## 4. Assign roles

A's *read* the problem.

M's *plan* how to solve it.

T's *solve* the problem and state the *answer*.

E's *look back* and determine whether the answer is reasonable.

## 5. Describe group task

Have group members perform the tasks as they solve Problems 1–8, page 105.

If time allows, students may switch tasks within their groups and work Problems 1–4 in More Practice Set 39, page 365.

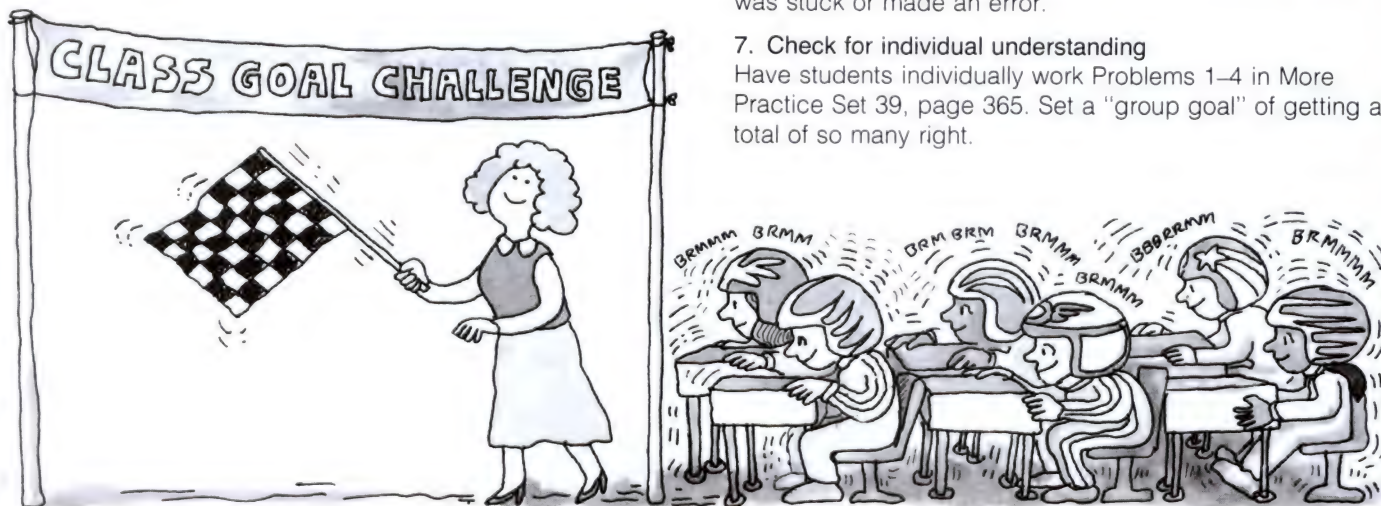
**Evaluation** (about 10 minutes)

## 6. Monitor skills for learning together

Use the "mystery group" technique to evaluate whether students asked leading questions to help someone who was stuck or made an error.

## 7. Check for individual understanding

Have students individually work Problems 1–4 in More Practice Set 39, page 365. Set a "group goal" of getting a total of so many right.





# Cooperative Learning Groups

Activities  
for Chapter 5

## Skill Activity

(Use with pages 128–129.)

### Teacher Presentation (about 15 minutes)

#### 1. Have students move to study groups

Keep the same study groups together for Chapters 4–6.

#### 2. Discuss skills for learning together

Review “explaining with pictures or objects” as a way to help someone who has forgotten a basic fact. In this activity, pictures are used with multiplication facts.

#### 3. Introduce the lesson

“6 in Multiplication,” pages 128–129

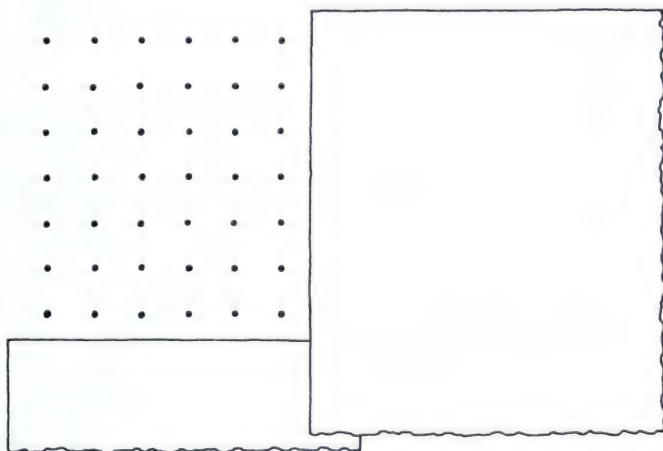
### Group Work (about 15 minutes)

#### 4. Assign roles

E's are materials managers. Each group will need dot paper (Teaching Aid J).

#### 5. Describe group task

Have students individually answer Exercises 1–32, page 129. Students should compare their answers when they finish. If there is disagreement, have them use dot paper to check their answers. For example, the diagram below illustrates how to check the answer to  $6 \times 7$ .



### Evaluation (about 10 minutes)

#### 6. Monitor skills for learning together

Use the “mystery person” technique to evaluate how well students helped others by explaining with pictures.

#### 7. Check for individual understanding

Have students individually work Exercises 1–34 in More Practice Set 48, page 368. Set a “class goal” of a certain number of groups having no more than a total of 7 errors.

## Problem-Solving Activity

(Use with pages 142–143.)

### Teacher Presentation (about 10 minutes)

#### 1. Have students move to study groups

Keep the same study groups together for Chapters 4–6.

#### 2. Discuss skills for learning together

Review the method of “asking leading questions” to help someone who is having trouble.

#### 3. Introduce the lesson

“Problem Solving: Write a Problem,” pages 142–143

### Group Work (about 20 minutes)

#### 4. Assign roles

A's and M's are encouragers.

#### 5. Describe group task

Each study group is assigned a different problem from page 143. Have each group member make up a problem which he or she can read and solve. If a student has difficulty making up a problem, the A's and M's should encourage group members to ask leading questions to help. Groups finishing early may begin work on another problem from page 143.

When all groups have finished their first set of problems, have students move into a new seating arrangement: all the T's form a new group, the E's another, etc. From these seats students can take turns reading their problem and seeing if the others can solve it.

### Evaluation (about 10 minutes)

#### 6. Monitor skills for learning together

Provide “teacher feedback” on how well students helped others by asking leading questions in the first phase of the group work period.

#### 7. Check for individual understanding

Write the following on the board.

|           |        |
|-----------|--------|
| Dinner #1 | \$5.00 |
| Dinner #2 | \$4.75 |
| Apples    | 25¢    |

Have all students individually write a problem that uses 2 or 3 of these amounts. The students should also write the answer to their problem. Collect all the papers and then pick 5 out of the pile at random. Set a “class goal” of 4 out of the 5 having a problem that makes sense and has the correct answer.





If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

### Skill Activity

(Use with pages 162–163.)

#### Teacher Presentation (about 15 minutes)

##### 1. Have students move to study groups

Keep the same study groups together for Chapters 4–6.

##### 2. Discuss skills for learning together

Discuss “thinking aloud” as a method of helping students learn as they work in their study groups.

##### 3. Introduce the lesson

“Multiplying Multiples of 10,” pages 162–163

Demonstrate “thinking aloud” with the 5 exercises in the “Try” section. Then have students individually work the 6 exercises in the top row of More Practice Set 60, page 373. Have students write the answers on a slip of paper. They are *not* to write their names on their papers. These papers should be collected immediately. They will be corrected by a “math captain” during the group work period. The number right will be used to establish a class goal in the “no-name challenge” in step 7.

#### Group Work (about 15 minutes)

##### 4. Assign roles

M's are checkers.

##### 5. Describe group task

Have the groups do Exercises 1–25, page 163, to make sure all group members can multiply numbers that are multiples of 10, 100, or 1,000. When a student is explaining a problem to another group member, he or she should “think aloud.”

#### Evaluation (about 10 minutes)

##### 6. Monitor skills for learning together

Use the “mystery group” technique to evaluate whether students thought aloud as they worked the problems.

##### 7. Check for individual understanding

Use the “no-name challenge” technique. Give the students a second slip of paper and have them rework the 6 exercises in the top row of More Practice Set 60, page 373. Challenge the class to beat the total they got right at the start of the period.

### Problem-Solving Activity

(Use with pages 174–175.)

#### Teacher Presentation (about 10 minutes)

##### 1. Have students move to study groups

Keep the same study groups together for Chapters 4–6.

##### 2. Discuss skills for learning together

Review how to “ask leading questions” to help someone who is having trouble.

##### 3. Introduce the lesson

“Problem Solving: Choose the Operation,” pages 174–175

#### Group Work (about 20 minutes)

##### 4. Assign roles

T's and E's are encouragers.

M's are summarizers.

##### 5. Describe group task

Read Problem 1, page 175, to the class. Then call for a brief silence period during which the students are to choose the operation they would use to solve the problem. Have the T's tell their group how they would solve the problem. If one of the T's needs help, another encourager should suggest that someone ask leading questions. Next, have the group solve the problem and agree on the answer. The M's then summarize how the problem was solved. When all groups have finished the problem, call on one of the T's to give the answer. Then have the E's, A's, and M's, in turn, tell their groups how to solve each of the other problems.

#### Evaluation (about 10 minutes)

##### 6. Monitor skills for learning together

Provide “teacher feedback” on how well students asked leading questions.

##### 7. Check for individual understanding

Assign each student one problem to work individually from More Practice Set 65, page 374: T's do Problem 3, E's do Problem 2, A's do Problem 1, and M's do Problem 4. Set a “group goal” of getting so many right.





# Cooperative Learning Groups

Activities  
for Chapter 7

## Skill Activity

(Use with pages 190–191.)

### Teacher Presentation (about 5 minutes)

1. Have students move to study groups  
Form new study groups for Chapters 7–9.
2. Discuss skills for learning together  
Review the importance of "settling disagreements without voting."
3. Introduce the lesson  
"Parallelograms," pages 190–191

### Group Work (about 30 minutes)

4. Assign roles  
This is the first time that "challenge matches" (described on page 473) will be used. Select a study group to serve as challenge match directors.

### 5. Describe group task

Demonstrate the challenge match procedure. Then have study groups use Exercises 1–20, page 191, to prepare for the challenge matches. Remind them to settle disagreements without voting.

During the preparation period, group members serving as challenge match directors should prepare the 1-to-50 lists for their respective matches. This time, each list has the same set of exercises marked off: Exercises 1–20 in More Practice Set 70, page 376.

### Evaluation (about 5 minutes)

6. Monitor skills for learning together  
Provide "teacher feedback" on how well students settled disagreements without voting.
7. Check for individual understanding  
The challenge match serves this purpose.

## Problem-Solving Activity

(Use with pages 198–199.)

### Teacher Presentation (about 15 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 7–9.
2. Discuss skills for learning together  
Discuss the importance of "locating and analyzing errors" to help students who are having trouble.
3. Introduce the lesson  
"Problem Solving: Use a Picture," pages 198–199  
Use Problem a in the "Try" section as an example.

### Group Work (about 15 minutes)

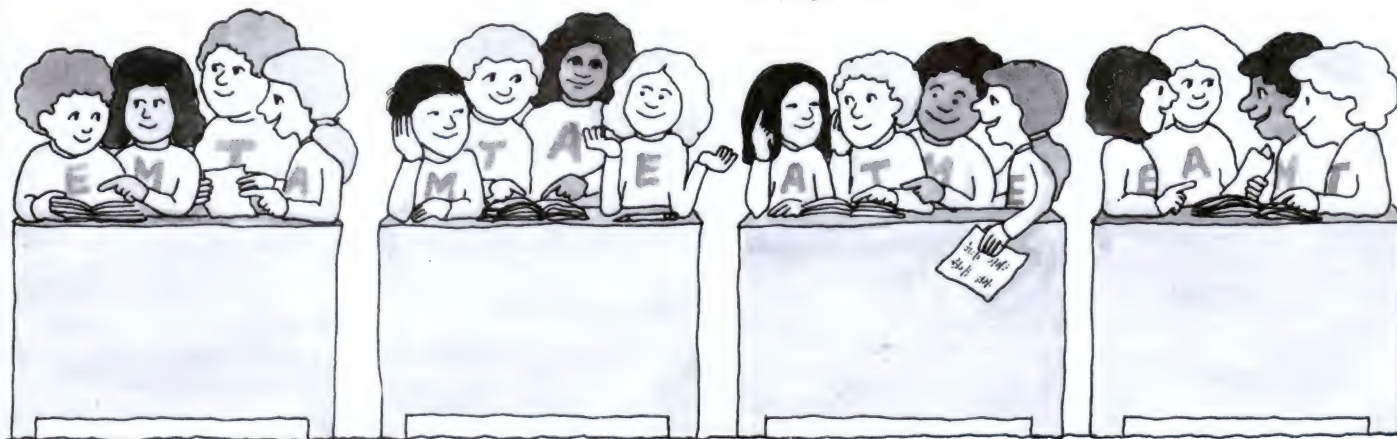
4. Assign roles  
M's are materials managers. They will need 10 2-inch squares. Four of the squares should be cut on the diagonal, thus creating 8 halves.

### 5. Describe group task

Have the M's get their materials while the T's, E's, and A's individually find the area of the figures in Exercises 1–6 on page 199. When group members complete the problems, they should compare answers. If there is disagreement, the M's construct the figure using the squares and half squares and demonstrate which answer is correct. After the 6 exercises have been checked, have group members take turns making different figures out of the shapes and challenging the others to determine the area. Remind students to help each other locate and analyze errors.

### Evaluation (about 10 minutes)

6. Monitor skills for learning together  
Use the "silent voting" technique. Have students evaluate how well their group pointed out specific errors when someone made a mistake and then helped analyze those errors.
7. Check for individual understanding  
Use a "signaled response" technique after having students individually work Problems 1–3 in More Practice Set 73, page 378.







If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

**Skill Activity**

(Use with pages 218–219.)

**Teacher Presentation** (about 5 minutes)**1. Have students move to study groups**

Keep the same study groups together for Chapters 7–9.

**2. Discuss skills for learning together**

Review the importance of "settling disagreements without voting."

**3. Introduce the lesson**

"1 and 0 in Division," pages 218–219

**Group Work** (about 30 minutes)**4. Assign roles**

Select a study group to be challenge match directors.

E's are materials managers. They should get about twenty 3 x 5 cards for group members to use to make flash-cards.

**5. Describe group task**

Have study groups use Exercises 1–24, page 219, to prepare for the challenge match. Remind them to settle disagreements without voting.

Group members serving as challenge match directors should prepare the 1-to-50 lists for their respective matches. This time, each list has the same exercises marked off: Exercises 1–35 in More Practice Set 81, page 381.

**Evaluation** (about 5 minutes)**6. Monitor skills for learning together**

Use the "silent voting" technique. Have students evaluate how well the groups settled disagreements without voting.

**7. Check for individual understanding**

The challenge match serves this purpose.

**Problem-Solving Activity**

(Use with pages 236–237.)

**Teacher Presentation** (about 15 minutes)**1. Have students move to study groups**

Keep the same study groups together for Chapters 7–9.

**2. Discuss skills for learning together**

Discuss the importance of "settling disagreements without voting."

**3. Introduce the lesson**

"Problem Solving: Choose the Operation," pages 236–237

**Group Work** (about 15 minutes)**4. Assign roles**

A's are encouragers.

**5. Describe group task**

Read Problem 1 on page 237 and then call for a 30-second silence period. During the silence period each student will decide which operation should be used. Then have the E's tell their groups whether they would add, subtract, multiply, or divide. The other group members signal thumbs up or thumbs down to indicate agreement or disagreement. Each group should reach a consensus.

Work Problems 2–10 in the same fashion. In each case, read the problem, call for a silence period, and then designate someone in each group (T's, E's, A's, or M's) to tell which operation should be used. If the group disagrees, the encourager should remind them to settle the disagreement without voting.

**Evaluation** (about 10 minutes)**6. Monitor skills for learning together**

Provide "teacher feedback" on whether groups avoided voting to settle disagreements.

**7. Check for individual understanding**

Use the "draw-a-name challenge" technique with the 10 problems in More Practice Set 88, page 383.





# Cooperative Learning Groups

Activities  
for Chapter 9

## Skill Activity

(Use with pages 262–263.)

### Teacher Presentation (about 5 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 7–9.

2. Discuss skills for learning together  
Discuss the value of "locating and analyzing errors."

3. Introduce the lesson  
"Two-Digit Divisors, One-Digit Quotients,"  
pages 262–263  
Use the exercises in the "Try" section to demonstrate the process.

### Group Work (about 30 minutes)

4. Assign roles  
Select a study group to be challenge match directors.

E's are checkers. They are the only ones who should go to the correcting station.

5. Describe group task  
Have study groups use Exercises 1–28, page 263, to prepare for the challenge matches. Answers should be made available at a correcting station. Students should help each other locate and analyze errors.

For each challenge match, use exercises from More Practice Set 98, page 387. T's do 19–42, E's do 13–36, A's do 13–36, and M's do 1–24.

### Evaluation (about 5 minutes)

6. Monitor skills for learning together  
Use the "mystery person" technique to evaluate whether students helped locate and analyze errors.

7. Check for individual understanding  
The challenge match serves this purpose.

## Problem-Solving Activity

(Use with pages 270–271.)

### Teacher Presentation (about 15 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 7–9.

2. Discuss skills for learning together  
Review the value of "asking leading questions."

3. Introduce the lesson  
"Problem Solving: Write an Equation," pages 270–271

### Group Work (about 15 minutes)

4. Assign roles  
A's *read* the problem.  
M's *plan* by writing an equation.  
T's *solve* the equation and state the *answer*.  
E's *look back* and determine whether the answer is reasonable.

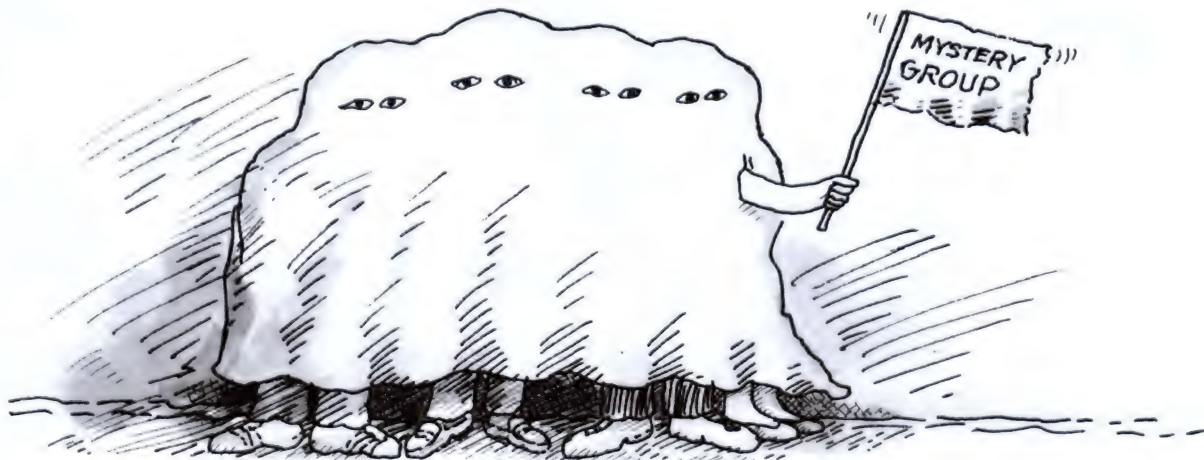
5. Describe group task  
Have group members carry out their different tasks as they solve Problems 1–8, page 271. Select one of the groups to demonstrate the process and have them solve Problem 1.

Emphasize that if a student has trouble, the others should help by asking leading questions, not by telling answers.

### Evaluation (about 10 minutes)

6. Monitor skills for learning together  
Provide "teacher feedback" on whether groups asked leading questions.

7. Check for individual understanding  
Using a problem from More Practice Set 101, page 388, set a "class goal" of a certain number of students getting the problem right.







If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

### Skill Activity

(Use with pages 286–287.)

#### Teacher Presentation (about 5 minutes)

**1. Have students move to study groups**

Form new study groups for Chapters 10–12.

**2. Discuss skills for learning together**

Review the importance of “explaining with pictures or diagrams.” In this activity, students use 10 x 10 grid paper to picture decimals when they’re having trouble.

**3. Introduce the lesson**

“Comparing Decimals,” pages 286–287

#### Group Work (about 30 minutes)

**4. Assign roles**

Select a study group to be challenge match directors.

E's serve as materials managers. Groups will need grid paper (Teaching Aid K).

**5. Describe group task**

Have study groups use Exercises 1–27, page 287, to prepare for the challenge matches. The E's should get 4 or 5 pieces of 10 x 10 grid paper for group members to use in picturing decimals as needed.

Then for all challenge matches, use Exercises 1–23 in More Practice Set 106, page 389.

#### Evaluation (about 5 minutes)

**6. Monitor skills for learning together**

Use the “mystery group” technique to evaluate whether groups used grid paper to picture decimals as needed.

**7. Check for individual understanding**

The challenge match serves this purpose.

### Problem-Solving Activity

(Use with pages 296–297.)

#### Teacher Presentation (about 15 minutes)

**1. Have students move to study groups**

Keep the same study groups together for Chapters 10–12.

**2. Discuss skills for learning together**

Review “asking leading questions” as a way to help those having difficulty.

**3. Introduce the lesson**

“Problem Solving: Too Much Information,” pages 296–297

#### Group Work (about 15 minutes)

**4. Assign roles**

M's are readers.

E's are checkers.

T's are encouragers.

**5. Describe group task**

Have the groups work Problems 1–6, page 297. The M's read the problem aloud while group members follow along silently in their books. Then members should take turns telling what information is needed and what is not needed to solve the problem and then explain why. If someone has trouble, the encouragers should make sure group members ask leading questions and avoid telling answers. When the needed information has been identified, all group members can work the problem. They should compare and reach a consensus on the answer.

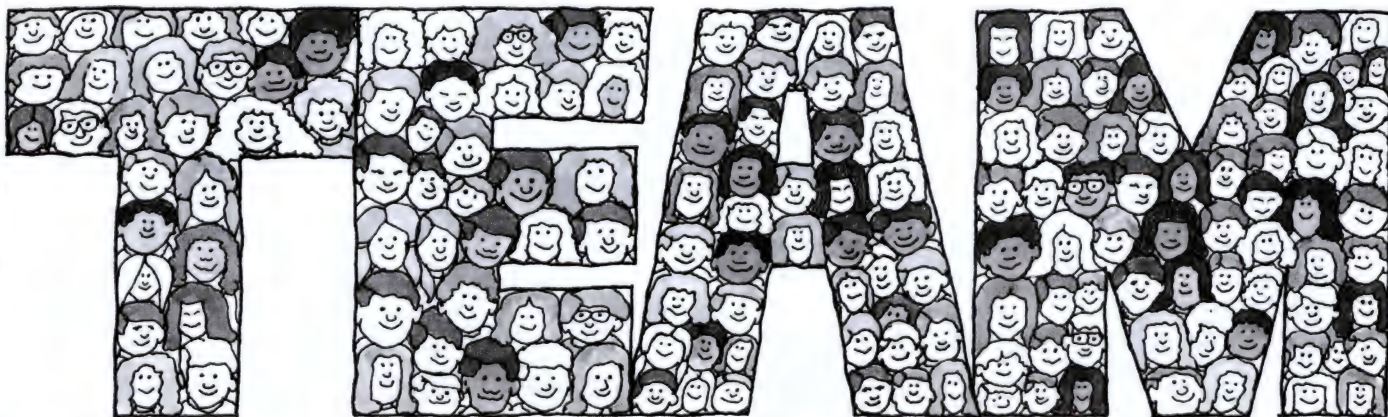
#### Evaluation (about 10 minutes)

**6. Monitor skills for learning together**

Use the “silent voting” technique. Have students respond to whether (1) as individuals, they tried to help students by asking leading questions and (2) the other group members avoided telling answers and remembered to ask leading questions.

**7. Check for individual understanding**

Use the “draw-a-name challenge” technique with the 4 problems in More Practice Set 110, page 391.





# Cooperative Learning Groups

Activities  
for Chapter 11

## Skill Activity

(Use with pages 324–325.)

### Teacher Presentation (about 5 minutes)

1. Have students move to study groups  
Keep the same study groups together for Chapters 10–12.
2. Discuss skills for learning together  
Focus on “asking leading questions” as a way to help someone who is having trouble.
3. Introduce the lesson  
“Subtraction: Different Denominators,” pages 324–325

### Group Work (about 30 minutes)

4. Assign roles  
Select a study group to be challenge match directors.  
A's are encouragers.
5. Describe group task  
Have study groups use Exercise 1–14, page 325, to prepare for the challenge matches. The A's should encourage students to ask “leading questions” as needed.  
Then for all challenge matches, use Exercises 1–20, in More Practice Set 122, page 395.

### Evaluation (about 5 minutes)

6. Monitor skills for learning together  
Provide “teacher feedback” on whether groups asked leading questions.
7. Check for individual understanding  
The challenge match serves this purpose.

## Problem-Solving Activity

(Use with pages 314–315.)

### Teacher Presentation (about 15 minutes)

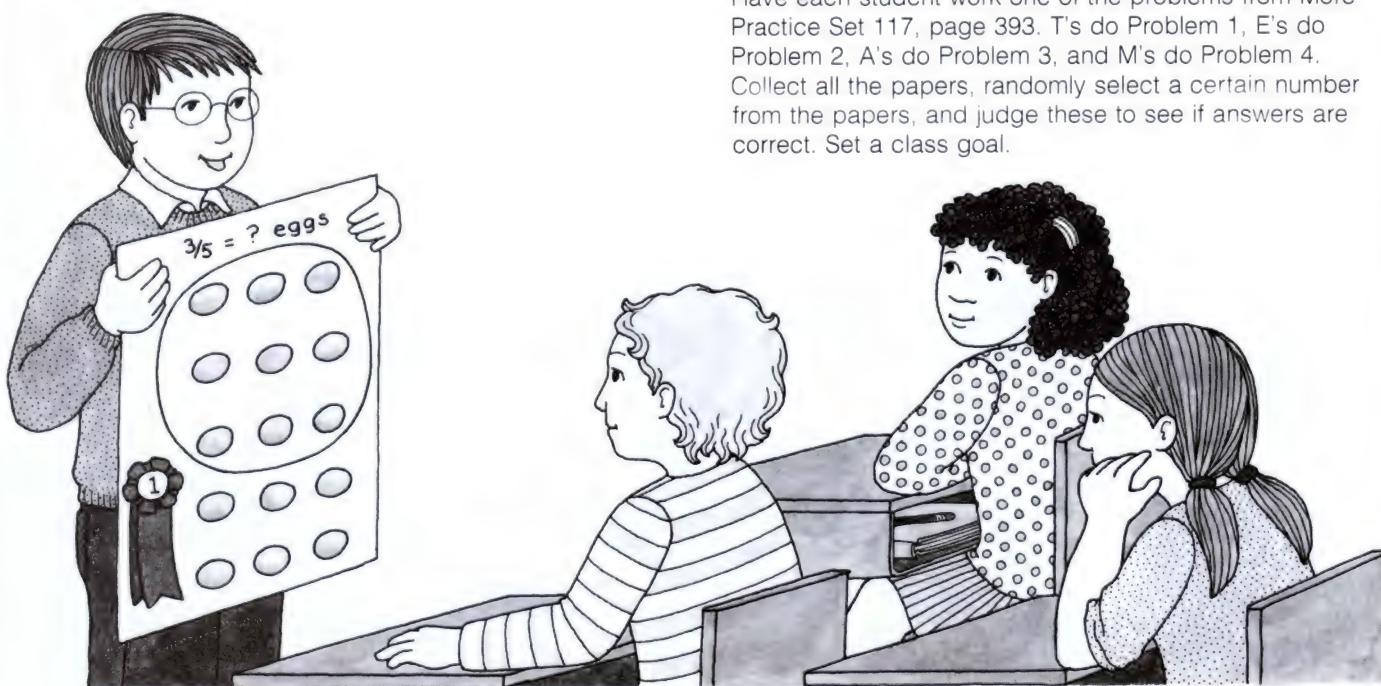
1. Have students move to study groups  
Keep the same study groups together for Chapters 10–12.
2. Discuss skills for learning together  
Focus on “explaining with pictures or objects.” In this activity, students draw pictures to solve fraction problems.
3. Introduce the lesson  
“Problem Solving: Use a Picture,” pages 314–315

### Group Work (about 15 minutes)

4. Assign roles  
E's are readers.
5. Describe group task  
Have groups work Problems 1–9, page 315. The E's read the problem aloud while the others follow along silently in their books. Taking turns, have each group member explain how to draw a solution to the problem. After the drawing has been described, all group members should individually attempt to draw it. Stress the importance of making a neat and organized drawing so that others can look at it and clearly see the solution.

### Evaluation (about 10 minutes)

6. Monitor skills for learning together  
Use the “mystery group” technique. Evaluate the group on whether members did a good job of sketching the solution to the problems.
7. Check for individual understanding  
Have each student work one of the problems from More Practice Set 117, page 393. T's do Problem 1, E's do Problem 2, A's do Problem 3, and M's do Problem 4. Collect all the papers, randomly select a certain number from the papers, and judge these to see if answers are correct. Set a class goal.







If you wish to try *cooperative learning* techniques, you'll find the introduction on pages 470–473 and chapter activities on pages 474–485.

### Skill Activity

(Use with pages 332–333.)

#### Teacher Presentation (about 5 minutes)

1. Have students move to study groups

Keep the same study groups together for Chapters 10–12.

2. Discuss skills for learning together

Remind students that “thinking aloud” can help them learn from each other.

3. Introduce the lesson

“Pictographs,” pages 332–333

Use the problems in the “Try” section as examples.

#### Group Work (about 30 minutes)

4. Assign roles

Select a study group to be challenge match directors.

T's and M's are encouragers.

5. Describe group task

Have study groups use Exercises 1–14, page 333, to prepare for the challenge matches. Have students think aloud as they do the exercises.

Then for all challenge matches, use Problems 1–9 in More Practice Set 123, page 395, and Problems 1–14, page 333.

#### Evaluation (about 5 minutes)

6. Monitor skills for learning together

Use the “silent voting” technique to have students evaluate how well their groups did at thinking aloud.

7. Check for individual understanding

The challenge match serves this purpose.

### Problem-Solving Activity

(Use with pages 344–345.)

#### Teacher Presentation (about 15 minutes)

1. Have students move to study groups

Keep the same study groups together for Chapters 10–12.

2. Discuss skills for learning together

Focus on “asking leading questions.”

3. Introduce the lesson

“Problem Solving: Use a Graph,” pages 344–345

#### Group Work (about 15 minutes)

4. Assign roles

A's are readers.

5. Describe group task

Have the groups work Problems 1–9, page 345. Group members should individually work the problems in sets of 3, check and reach a consensus on answers, and then help those students who are having trouble by asking leading questions. If some students can't read the problems, the A's can help as readers but must not work the problems themselves.

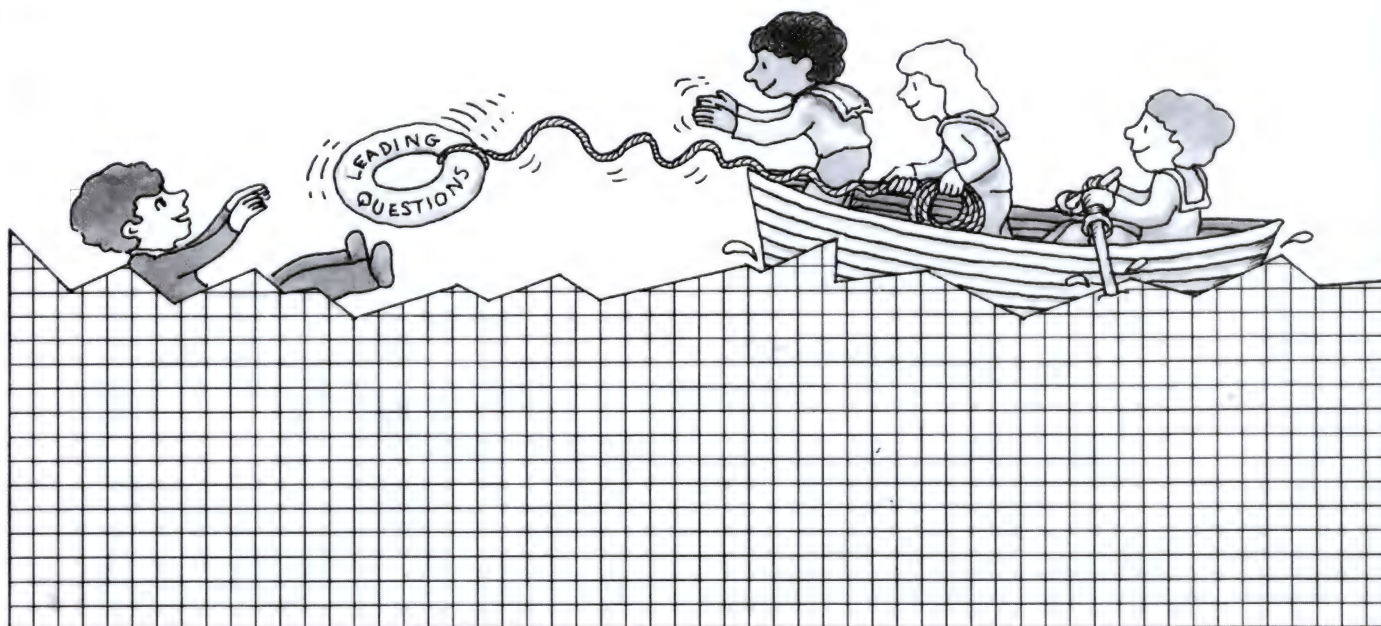
#### Evaluation (about 10 minutes)

6. Monitor skills for learning together

Provide “teacher feedback” to evaluate whether students asked leading questions to help someone who was having trouble.

7. Check for individual understanding

Have students work Problems 1–4 in More Practice Set 128, page 397. Use a “signaled response” technique to check the students' answers.









## Tables

### Metric System

|                      |  |
|----------------------|--|
| <b>Length</b>        | 10 millimeters (mm) = 1 centimeter (cm)<br>10 centimeters = 1 decimeter (dm)<br>100 millimeters = 1 meter (m)<br>10 decimeters = 1 meter (m)<br>100 centimeters = 1 meter (m)<br>1,000 meters = 1 kilometer (km)             |
| <b>Area</b>          | 100 square millimeters (mm <sup>2</sup> ) = 1 square centimeter (cm <sup>2</sup> )<br>10,000 square centimeters = 1 square meter (m <sup>2</sup> )<br>100 square meters = 1 are (a)<br>10,000 square meters = 1 hectare (ha) |
| <b>Volume</b>        | 1,000 cubic millimeters (mm <sup>3</sup> ) = 1 cubic centimeter (cm <sup>3</sup> )<br>1,000 cubic centimeters = 1 cubic decimeter (dm <sup>3</sup> )<br>1,000,000 cubic centimeters = 1 cubic meter (m <sup>3</sup> )        |
| <b>Mass (weight)</b> | 1,000 milligrams (mg) = 1 gram (g)<br>1,000 grams = 1 kilogram (kg)<br>1,000 kilograms = 1 metric ton (t)  |
| <b>Capacity</b>      | 1,000 milliliters (mL) = 1 liter (L)   |

### Customary System

|                 |  |
|-----------------|--|
| <b>Length</b>   | 12 inches (in) = 1 foot (ft)<br>3 feet = 1 yard (yd)<br>36 inches = 1 yard (yd)<br>1,760 yards = 1 mile (mi)<br>5,280 feet = 1 mile (mi)<br>6,076 feet = 1 nautical mile |
| <b>Area</b>     | 144 square inches (sq. in) = 1 square foot (sq. ft)<br>9 square feet = 1 square yard (sq. yd)<br>4,840 square yards = 1 acre (A)   |
| <b>Volume</b>   | 1.28 cubic inches (cu. in) = 1 cubic foot (cu. ft)<br>27 cubic feet = 1 cubic yard (cu. yd)  |
| <b>Weight</b>   | 16 ounces (oz) = 1 pound (lb)<br>2,000 pounds = 1 ton (T)  |
| <b>Capacity</b> | 8 fluid ounces (fl. oz) = 1 cup (c)<br>2 cups = 1 pint (pt)<br>2 pints = 1 quart (qt)<br>4 quarts = 1 gallon (gal)   |

### Time

|                        |
|------------------------|
| 60 seconds = 1 minute  |
| 60 minutes = 1 hour    |
| 24 hours = 1 day       |
| 7 days = 1 week        |
| 365 days = 1 year      |
| 52 weeks = 1 year      |
| 12 months = 1 year     |
| 366 days = 1 leap year |

### Addition-Subtraction Table

|   |   |    |    |    |    |    |    |    |    |    |
|---|---|----|----|----|----|----|----|----|----|----|
| + | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 0 | 0 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 1 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 2 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 3 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 4 | 4 | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 5 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 6 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | 7 | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 8 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 9 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

### Multiplication-Division Table

|   |   |    |    |    |    |    |    |    |    |
|---|---|----|----|----|----|----|----|----|----|
| x | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 1 | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 2 | 2 | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 |
| 3 | 3 | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 |
| 4 | 4 | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
| 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 |
| 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |
| 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 |

## Glossary

**Acute angle** An angle that has a measure less than 90°.

**Addend** A number that is added. In  $8 + 4 = 12$ , the addends are 8 and 4.

**Angle** ( $\angle$ ) The figure formed by two rays with the same endpoint.

**Area** A number indicating the size of the inside of a plane figure. The area of this figure is 8 square units.



**Associative property of addition** The way in which addends are grouped does not affect the sum. Also called the grouping property of addition. For example:  $(7 + 2) + 5 = 7 + (2 + 5)$

**Associative property of multiplication** The way in which factors are grouped does not affect the product. Also called the grouping property of multiplication. For example:  $(7 \times 2) \times 5 = 7 \times (2 \times 5)$

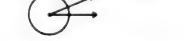
**Average** A number obtained by dividing the sum of two or more addends by the number of addends.

**BASIC** A simple language used to give instructions to computers.

**Basic fact** A number sentence that has at least two one-digit numbers. The sentences below are examples of basic facts:  $7 + 2 = 9$ ,  $16 - 7 = 9$ ,  $5 \times 3 = 15$ ,  $8 \div 4 = 2$

**Cardinal number** A number such as three, used to count or to tell how many.

**Central angle** An angle with its vertex at the center of a circle.



**Circle** A plane figure with all of its points the same distance from a given point called the center.

**Circumference** The distance around a circle.

**Common denominator** A common multiple of two or more denominators. A common denominator for  $\frac{1}{2}$  and  $\frac{1}{3}$  is 6.

**Common factor** A number that is a factor of two or more numbers. A common factor of 6 and 12 is 3.

**Common multiple** A number that is a multiple of two or more numbers. A common multiple of 4 and 6 is 12.

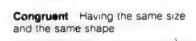
**Commutative property of addition** The order in which numbers are added does not affect the sum. Also called the order property of addition. For example:  $4 + 6 = 6 + 4$

**Commutative property of multiplication** The order in which numbers are multiplied does not affect the product. Also called the order property of multiplication. For example:  $4 \times 6 = 6 \times 4$

**Composite number** A whole number greater than 0 that has more than two factors. 12 is a composite number because it has more than two factors: 1, 2, 3, 4, 6, and 12.

**Computer program** A set of instructions that tells the computer how to do a certain job.

**Cone** A space figure formed by connecting a circle to a point not in the plane of the circle.



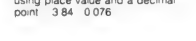
**Congruent** Having the same size and the same shape.

**Cross-products** For the ratios  $\frac{a}{b}$  and  $\frac{c}{d}$ , the cross-products are  $a \times d$  and  $b \times c$ .

**Cube** A prism with all square faces.



**Cylinder** A space figure shaped like this.

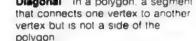


**Decimal** A number that is written with a decimal point. 3.84, 0.076

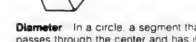
**Degree** (of an angle) A unit for measuring angles.



**Diagonal** In a polygon, a segment that connects one vertex to another vertex that is not a side of the polygon.



**Diameter** In a circle, a segment that passes through the center and has its endpoints on the circle.



**Difference** The answer to a subtraction problem. In  $95 - 68 = 27$ , the difference is 27.

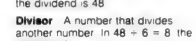
**Digit** Any of the single symbols used to write numbers. In the base-ten system, the digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

**Distributive property** The general pattern of numbers of which the following is an example:  $4 \times (7 + 3) = (4 \times 7) + (4 \times 3)$

**Dividend** A number that is divided by another number. In  $48 \div 6 = 8$ , the dividend is 48.

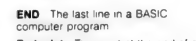
**Divisor** A number that divides another number. In  $48 \div 6 = 8$ , the divisor is 6.

**Edge** In a space figure, a segment where two faces meet.



**END** The last line in a BASIC computer program.

**Endpoint** The point at the end of a segment or a ray.



**Equal fractions** Fractions that name the same number;  $\frac{1}{2}$  and  $\frac{2}{4}$  are equal fractions.

**Equal ratios** Ratios indicating the same rate or comparison, such as  $\frac{1}{2}$  and  $\frac{2}{4}$ . Cross-products of equal ratios are equal:  $3 \times 12 = 4 \times 9$

**Equation** A mathematical sentence that uses the = symbol.  $14 - 7 = 7$

**Equilateral triangle** A triangle with all three sides congruent.

**Even number** A whole number with a factor of 2.

**Expanded form** The expanded form for 5,176 is  $5,000 + 100 + 70 + 6$

**Exponent** In  $4^2$ , the exponent is 3. It tells that 4 is to be used as a factor three times:  $4^2 = 4 \times 4 \times 4$

**Face** A flat surface that is part of a polyhedron.



**Factor** (1) A number to be multiplied. (2) A number that divides evenly into a given second number is a factor of that number.

**Family of facts** The related number sentences for addition and subtraction (or multiplication and division) that contain all the same numbers:  $5 + 3 = 8$ ,  $8 - 3 = 5$ ,  $3 \times 5 = 15$ ,  $15 \div 3 = 5$

**Flow chart** A diagram illustrating the steps used to solve a problem.

**FOR...NEXT** BASIC statements in a computer program that tell the computer to do something a certain number of times.

**FORWARD (FD)** A LOGO command that tells the turtle to move forward a certain number of steps.

**Fraction** A number written in the form  $\frac{a}{b}$ , such as  $\frac{1}{2}$ , or  $\frac{3}{4}$ , or  $\frac{5}{8}$

**GO TO** A BASIC statement in a computer program that tells the computer to go to another line in the program.

**Graph** (1) A picture used to show data. Some types of graphs are bar graphs, circle graphs, line graphs, pictographs and coordinate graphs.

**Greater than (>)** A relation between two numbers with the greater number given first:  $8 > 5$ ,  $9 > 14$ ,  $3 > 2$

**Greatest common factor** The greatest number that is a factor of two or more numbers. The greatest common factor of 8 and 12 is 4.

**Grouping property** See Associative property of addition and Associative property of multiplication.

**Hexagon** A six-sided polygon.

**IF...THEN** A BASIC statement used to test certain conditions and to act on the results of the test.

**Improper fraction** A fraction that names a whole number or a mixed number, such as  $\frac{5}{4}$  and  $2\frac{1}{2}$

**INPUT** A BASIC statement in a computer program that allows information to be entered into the program by the program user.

**Integers** The whole numbers and their opposites. Some integers are +2, -2, +75, and -75.

**Intersecting lines** Two lines that meet at exactly one point.



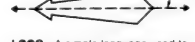
**Isoceles triangle** A triangle with at least two sides congruent.

**Least common multiple** The smallest number that is a common multiple of two given numbers. The least common multiple of 6 and 8 is 24.

**Less than (<)** A relation between two numbers:  $5 < 8$ ,  $14 < 9$ ,  $3 < 2$

**LET** A BASIC statement that allows a value to be assigned to a memory location named by a letter.

**Line of symmetry** A fold line of a figure that makes the two parts of the figure match exactly.



**LOGO** A simple language used to give instructions to a computer.

**Lowest terms** A fraction is in lowest terms if 1 is the only number that will divide both the numerator and the denominator.

**Minuend** A number from which another number is subtracted. In  $95 - 68 = 27$ , the minuend is 95.

**Mixed number** A number that has a whole number part and a fraction part, such as  $3\frac{1}{2}$  and  $6\frac{3}{4}$

**Multiple** A multiple of a number is the product of that number and a whole number. Some multiples of 3 are 3, 6, and 9.

**Multiplicand** A number that is multiplied by another number:  $7 \times 7$ . The multiplicand is 7.

**Multiplier** A number that multiplies another number:  $3 \times 3$ . The multiplier is 3.

**Multiplier** A number that multiplies another number:  $3 \times 3$ . The multiplier is 3.

**Negative integer** An integer less than 0, such as -1, -5, -7, or -10.

**Number pair** See Ordered pair.

**Number sentence** An equation or an inequality:  $3 + 5 = 8$ ,  $4 < 7$ ,  $9 > 6$

**Obtuse angle** An angle that has a measure greater than 90° and less than 180°.

**Octagon** An eight-sided polygon.

**Odd number** A whole number that does not have 2 as a factor.

**Opposites** Two numbers whose sum is 0. +5 and -5 are opposites because  $+5 + -5 = 0$ .

**Order property** See Commutative property of addition and Commutative property of multiplication.

**Ordered pair** A number pair, such as (3, 5), in which 3 is the first number and 5 is the second number.

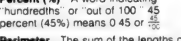
**Ordinal number** A number, such as third, used to tell order or position.

**Output** Any information that is produced by a computer.

**Parallel lines** Lines in the same plane that do not meet.



**Parallelogram** A quadrilateral with opposite sides parallel.



**Pentagon** A five-sided polygon.

**Percent (%)** A word indicating "hundredths" or "out of 100." 45 percent (45%) means 0.45 or  $\frac{45}{100}$ .

**Perimeter** The sum of the lengths of the sides of a polygon.

**Perpendicular lines** Two intersecting lines that form right angles.



**PI (π)** The number obtained by dividing the circumference of any circle by its diameter. A common approximation for π is 3.14.

**Place value** In a number, the value given to the place in which a digit appears. In 683, 6 is in the hundreds place, 8 is in the tens place, and 3 is in the ones place.

**Polygon** A plane figure made up of segments called its sides, each side intersecting two other sides, one at each of its endpoints.



**Polyhedron** A space figure with all flat surfaces. The outline of each surface is a polygon.



**Positive integer** An integer greater than 0, such as +1, +2, +10, or +35.

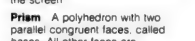
**Power** 3<sup>4</sup> is read "3 to the fourth power."  $3^4 = 3 \times 3 \times 3 \times 3 = 81$ . The fourth power of 3 is 81. 4<sup>2</sup> is read "4 to the second power" or "4 squared." See Exponent.

**Prime factor** A factor that is a prime number. The prime factors of 10 are 2 and 5.

**Prime number** A whole number greater than 1 that has exactly two factors: itself and 1. 17 is a prime number.

**PRINT** An instruction to the computer to give certain output on the screen.

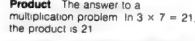
**Prism** A polyhedron with two parallel congruent faces, called bases. All other faces are parallelograms.



**Probability** A number that tells how likely it is that a certain event will happen.

**Product** The answer to a multiplication problem. In  $3 \times 7 = 21$ , the product is 21.

**Pyramid** The space figure formed by connecting points of a polygon to a point not in the plane of the polygon. The polygon and its interior is the base.



**Quadrilateral** A four-sided polygon.

**Quotient** The answer to a division problem. In  $48 \div 6 = 8$ , the quotient is 8.

**Radius** (1) In a circle, a segment that connects the center of the circle with a point on the circle. (2) In a circle, the distance from the center to a point on the circle.



**Ratio** A pair of numbers that expresses a rate or a comparison.

**Ray** Part of a line that has one endpoint and goes on and on in one direction.

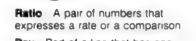


**Reciprocal** Two numbers whose product is 1.  $\frac{1}{2}$  and 2 are reciprocals because  $\frac{1}{2} \times 2 = 1$ .

**Rectangle** A parallelogram with four right angles.

**Rectangular prism** See Prism.

**Regular polygon** A polygon with all sides congruent and all angles congruent.



**REMARK** A remark in a program that is intended to be read by someone who lists the program, but it does not affect the logic of the program.

**Remainder** When 20 is divided by 6, the remainder is 2.

**REPEAT** A LOGO command that causes a list of commands to be done many times.

**Right angle** An angle that has a measure of 90°.

**RIGHT (RT)** A LOGO command that directs the turtle to turn right to a specified number of turtle turns.

**Right triangle** A triangle with one right angle.

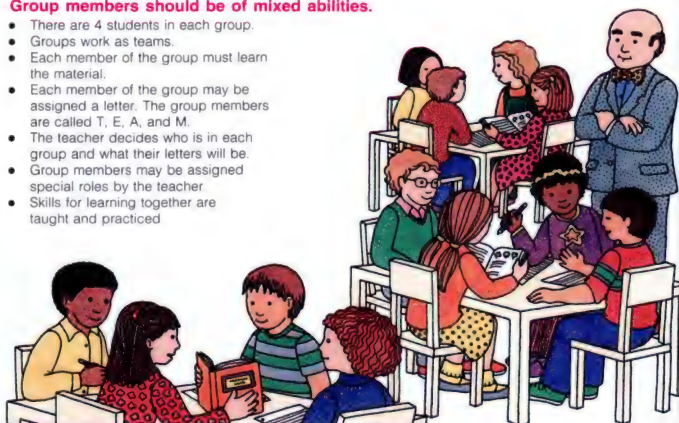


For further information about working in groups, see the spotlight section titled *Cooperative Learning Groups* at the back of this Teacher's Edition.

### Working in Groups: Main Ideas

**Group members should be of mixed abilities.**

- There are 4 students in each group.
- Groups work as teams.
- Each member of the group must learn the material.
- Each member of the group may be assigned a letter. The group members are called T, E, A, and M.
- The teacher decides who is in each group and what their letters will be.
- Group members may be assigned special roles by the teacher.
- Skills for learning together are taught and practiced.



Working in groups gives you a chance to work and learn with other students.

Why work in groups? Which 3 reasons are most important to you?

1. Working in groups is a good change of pace.
2. I can get more help in a group.
3. I learn better when I explain to others.
4. I like being able to ask questions in a small group rather than in front of the whole class.
5. I get to know my classmates better.
6. I like to help others.
7. Working in groups makes math more fun.
8. Working in groups helps us learn to work as a team.

Which reason do you think was picked by the greatest number of students? Why?

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### Working in Groups: Description of a Group Activity

Here are the steps in a typical group activity.

Step 1: The students move into their groups. Remember, the teacher selects the students for each group. Stay with the same group until the teacher forms new groups.

**It is recommended that new groups be formed about every 9 weeks.**

Step 2: The class discusses one of the skills for learning together.

- Thinking Aloud
- Settling Disagreements Without Voting
- Locating and Analyzing Errors
- Asking Leading Questions
- Explaining with Pictures or Objects

Step 3: The teacher indicates what the groups will be working on

Step 4: The teacher may assign a role to one or more students in the group. Here are some possible roles.

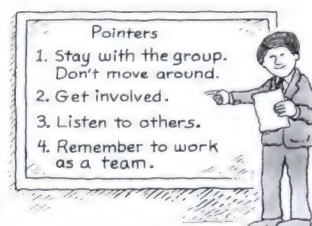
- **Reader** This student reads aloud while the others follow along silently.
- **Encourager** This student encourages other members to take part and to use the skills for learning together.
- **Summarizer** At different times, this student summarizes the group's thinking and may report to other groups.
- **Checker** This student may ask group members to explain their thinking or may ask others if they agree. The checker may go to an answer station or to another group to check the group's answer.
- **Materials Manager** This student gets any materials that are needed and returns them at the end of the period.

Step 5: The teacher gives any special instructions for how the group is to work. The group works on the task.

Step 6: The teacher checks how well the group worked together

Step 7: The teacher checks how well the group understands the lesson.

Which role in Step 4 is your favorite? Why?



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### Working in Groups: Skills for Learning Together

#### Asking Leading Questions



When a group member doesn't understand, it may help to ask that person leading questions.

**Example:** A group member did not know how to solve this problem. "Mr. Sims bought three \$17 shirts and four \$9 ties. How much change did he get from \$100?" The other students could ask leading questions such as:

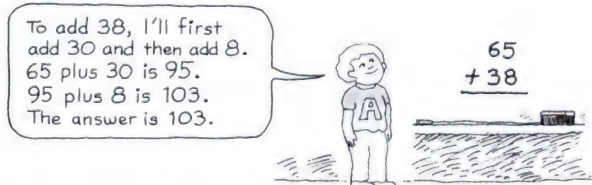
- "How much do the shirts cost?"
- "How much do the ties cost?"
- "What was the total cost?"

Leading questions help to point someone to the important parts of the problem. Asking questions keeps them trying. Telling the answer doesn't help. They still would not understand how to solve the problem.

#### Thinking Aloud

When you think aloud you tell how you would solve the problem. Thinking aloud helps you understand better. Your thinking aloud also helps those who are listening. If you run into trouble, they will know where your problem is. When help is needed or when the others disagree, they should only ask leading questions. They shouldn't tell you the answer.

**Example:** Michael thought aloud as he did an addition problem mentally.



Think aloud as you do this problem. Do you agree with Michael's thinking?

**Michael's thinking is valid.**

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### Working in Groups: More Skills for Learning Together

#### Locating and Analyzing Errors

It is easy to say that an answer is wrong. It is harder to find the error and figure out how it was made.

**Example:** A group of students solved this problem. In a race, Ann is 325 feet ahead of Jill, and Jill is 287 feet ahead of Sue. Mary is 436 feet behind Jill. How far apart are Ann and Sue?



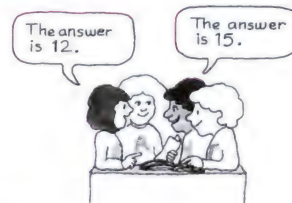
Can you find the error? Explain how the error was made.

**Note the error in recording the distance between Ann and Jill.**

#### Settling Disagreements Without Voting

If group members disagree on an answer, they should keep talking until they all agree.

Explain why this is better than voting on which answer is correct.



#### Explaining with Pictures or Objects

When someone has trouble solving a problem, it may help to have that person or another group member explain the problem or solution using pictures or objects.

How would you draw a picture for the problem at the top of this page?



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